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LOCKWOOD CORP.
NED044101442

CME

APPENDIX

9/30/86

(RECONSTRUCTED 4/10/89)

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R00020728

RCRA Records Center

APPENDIX A

Analyses of water from sources in Scotts Bluff County, Nebr., and adjacent areas

[Well numbers correspond to numbers in table of well records, pp. 136-148. Parts per million.]

Wells in sand and gravel

Well No.	Owner or point of collection	Depth (feet)	Date of collection	Total dissolved solids	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Total hardness as CaCO ₃	Analyst
	City of Gering	80	Dec. 4, 1937	782			48	22		212	462	182	52	0.0	38	210	W. M. Noble.
	City of Henry	80	Dec. 10, 1937	447			78	22		54	305	124	12	.8	5.9	285	Do.
	Village of Lyman	50-80	Dec. 11, 1937	732			66	18		187	500	169	31	2.0	13	239	Do.
	City of Minatare	60-90	Dec. 4, 1937	633			82	21		122	395	174	32	.5	7.2	291	Do.
	City of Mitchell	83	Dec. 10, 1937	427			74	23		49	281	108	23	.8	11	279	Do.
	City of Morrill	60	do.	487			74	24		69	317	140	13	.6	10	283	Do.
	City of Scottsbluff	100±	Dec. 3, 1937	545	28	0.04	89	20		70	340	130	24	.3	12	304	Do.
15	Frank Thomas	14.3	Dec. 11, 1937								456	440	75	3.3	8.2	345	W. M. Noble.
21	W. G. Parker	41.5	do.								403	200	15	.5	1.4	315	Do.
24	Harvey Harward	29.3	do.								383	230	15	1.1	8.8	303	Do.
49	Otto Juergens	50.6	Nov. 30, 1936				103	19		78	374	157	15	1.2	14	335	M. D. Foster.
98	B. J. Pieper	44.7	Dec. 15, 1937	571							383	200	17	.4	4.2	315	W. M. Noble.
127	George Emery	26.2	Dec. 14, 1937								369	230	28	1.9	15	126	Do.
195	Harry Pieper	49.6	Dec. 13, 1937	577			89	27		79	325	194	21	.9	6.0	333	Do.
282	Harry Long	36.8	Dec. 6, 1937								303	180	14	.0	8.0	300	Do.
292	Virgil Trout	59.6	Nov. 30, 1936	432			72	14		65	270	134	9	.6	4.8	237	E. W. Lohr.
409	Ollie Jones	110	Dec. 10, 1937								324	140	58	.3	120	162	Do.

Wells in the Brule formation

17	J. C. Grim	114.5	Dec. 11, 1937								291	30	30	0.6	25	58	W. M. Noble.
32	Mrs. Frank Moritz	140	do.								192	80	11	.3	5.9	189	Do.
37	School District	76.8	do.								259	180	11	.0	4.7	267	Do.
78	School land	77.4	Dec. 14, 1937								266	110	34	.1	6.9	188	Do.
88	F. G. Tanner Estate	34.2	do.								423	200	29	.2	17	234	Do.
150	J. B. Schrock	48.7	Dec. 3, 1937								224	110	10	.3	4.7	195	Do.
168	S. A. Burkey	89.7	Dec. 2, 1937								240	22	10	.0	29	201	Do.
172	Mrs. Addie Lewis	62.9	Dec. 14, 1937								350	90	67	.9	25	74	Do.
209	Joe McCoy	68.1	Dec. 3, 1937								257	170	11	.0	8.8	237	Do.
259	F. E. McClanahan	17.6	Dec. 13, 1937								1,065	400	195	2.2	17	52	Do.
272	Andrew Oleson	142.3	Dec. 3, 1937								294	110	17	.6	20	44	Do.
275	Carl Thomas	63.6	do.								262	170	13	.3	15	273	Do.
277	Ola Mitchell	66.6	do.								263	150	11	.4	11	225	Do.
303	Mrs. D. L. Hawbaker	83.6	Dec. 6, 1937								226	16	5	.5	9	112	Do.

Wells in the Lance formation

378	R. H. Miller	¹ 83	Dec. 1, 1937								642	7	7.0	1.8	0.0	10	W. M. Noble.
385	Alec Libsack	223	do.	690			3.3	1.5		293	771	1.8	9.0	1.6	.18	14	Do.
388	John Gompert	¹ 265	do.								842	2	6.0	1.6	.0	6	Do.
398	Gus Thulin	¹ 85.5	do.								525	20	8.0	1.4	.0	2	Do.
F-4	City of Scottsbluff	400*	Dec. 3, 1937	768	9.2	0.03	11	4.9	296	6.0	666	3.5	107	2.0	.05	48	Do.

North Platte River

	At McGrew Bridge		Dec. 11, 1937								274	100	16	0.6	6.7	225	W. M. Noble.
	At River Bridge south of Henry		Dec. 3, 1937								324	140	2.0	.4	.0	279	Do.

¹ Reported depth.

* Less than 5 parts per million.

NORTH PLATTE RIVER BASIN

06680800 Hale Drain near Scottsbluff, Nebr.

Location.--At Tri-State canal, 135 ft downstream from culvert and 3 mi northeast of Scottsbluff, Scotts Bluff County.

Period of record.--September 1961 to September 1965.

Statistical data for selected chemical constituents

Constituent	Units	No. of measure- ments	Max- imum	Min- imum	Mean	Median	Standard devi- ation	Ninetieth percent- ile	Tenth percent- ile
Specific conductance	umho/cm	43	934	660	794	802	49	842	733
Dissolved solids, residue	mg/L	43	612	476	566	570	31	602	523
Dissolved solids, sum	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Hardness as CaCO ₃	mg/L	43	252	142	222	226	24	246	185
Calcium, dissolved	mg/L	43	75	33	62	66	9.1	72	50
Magnesium, dissolved	mg/L	43	22	13	16	16	1.8	19	14
Sodium, dissolved	mg/L	43	94	62	84	87	7.2	91	74
Potassium, dissolved	mg/L	43	12	6.9	8.8	8.7	1.0	10	7.8
Bicarbonate ion	mg/L	43	288	172	255	262	27	284	220
Sulfate, dissolved	mg/L	43	184	143	167	164	10	180	156
Chloride, dissolved	mg/L	43	19	13	17	18	1.3	19	16
Fluoride, dissolved	mg/L	43	0.6	0.1	0.4	0.4	0.1	0.5	0.3
Silica, dissolved	mg/L	43	74	32	58	62	9.2	66	44
Boron, dissolved	mg/L	43	320	100	175	183	34	200	140
Iron, dissolved	ug/L	25	160	0	42	28	41	88	12
Manganese, dissolved	ug/L	1	-----	-----	20	-----	-----	-----	-----
Nitrite + nitrate as N, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Nitrate as N, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Nitrate as NO ₃ , dissolved	mg/L	43	19	4.1	7.9	-----	2.3	-----	-----
Ammonia N, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Organic N, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Phosphorus, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Phosphorus, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Fecal coliform	col/100 ml	-----	-----	-----	-----	-----	-----	-----	-----
Fecal streptococci	col/100 ml	-----	-----	-----	-----	-----	-----	-----	-----
Oxygen, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Biochemical oxygen demand (5-day)	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
pH	pH units	43	8.3	7.3	7.8	7.8	0.3	8.1	7.4
Color	Co - Pt units	7	10	4	7	-----	2.6	-----	-----

NORTH PLATTE RIVER BASIN

06680800 Hale Drain near Scottsbluff, Nebr.--Continued

Results of regression analyses relating concentrations of selected chemical constituents to specific conductance (SpC)

Dissolved constituents (mg/L)	No. of measurements	Regression equation	Correlation coefficient	Percent explained variance	Standard error of estimate (mg/L)
Dissolved solids, residue (RDS)	43	RDS = 0.584(SpC) + 101.700	0.93	86	12
Dissolved solids, sum (SDS)	-----				
Hardness as CaCO ₃ (TH)	43	TH = 0.351(SpC) - 56.239	.70	50	18
Calcium (Ca)	43	Ca = 0.130(SpC) - 40.355	.69	48	6.6
Magnesium (Mg)	43	Mg = 0.009(SpC) + 8.818	*.24	6.0	1.8
Sodium (Na)	43	Na = 0.083(SpC) + 18.417	.56	32	6.0
Potassium (K)	43	K = -0.0002(SpC) + 8.984	*-.01	.02	1.0
Bicarbonate (HCO ₃)	43	HCO ₃ = 0.495(SpC) - 137.492	.91	82	11
Sulfate (SO ₄)	43	SO ₄ = 0.067(SpC) + 113.896	.33	11	9.5
Chloride (Cl)	43	Cl = 0.010(SpC) + 8.746	.40	16	1.2
Silica (Si)	43	Si = 0.064(SpC) + 7.077	.34	12	8.8
Nitrite + Nitrate as N (NO ₂ -NO ₃)	-----				

Results of regression analyses relating specific conductance to water discharge (Q)

No. of measurements	Water discharge (ft ³ /s)		Regression equation	Correlation coefficient	Percent explained variance	Standard error of estimate	
	Maximum	Minimum				Log units	Percent
43	20.3	1.4	SpC = 752 Q ^{0.03626}	0.44	20	0.024	5.5

NORTH PLATTE RIVER BASIN

06681300 Gering Drain at Mitchell-Gering Canal near Gering, Nebr.

Location.--At Mitchell-Gering canal, 2.8 mi southwest of Gering, Scotts Bluff County.

Period of record.--July 1961 to September 1965.

Statistical data for selected chemical constituents

Constituent	Units	No. of measure- ments	Max- imum	Min- imum	Mean	Median	Standard devi- ation	Ninetieth percent- ile	Tenth percent- ile
Specific conductance	umho/cm	47	1,180	455	1,040	1,110	149	1,180	860
Dissolved solids, residue	mg/L	47	823	314	725	780	108	823	580
Dissolved solids, sum	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Hardness as CaCO ₃	mg/L	47	242	70	166	162	40	215	100
Calcium, dissolved	mg/L	47	69	11	47	49	13	62	25
Magnesium, dissolved	mg/L	47	19	6.9	12	11	3.4	17	8.5
Sodium, dissolved	mg/L	47	231	34	169	190	47	215	97
Potassium, dissolved	mg/L	47	17	7.3	11	11	1.5	13	9.5
Bicarbonate ion	mg/L	47	432	226	364	400	65	429	265
Sulfate, dissolved	mg/L	47	224	37	194	198	26	209	180
Chloride, dissolved	mg/L	43	32	5.4	24	26	4.6	29	19
Fluoride, dissolved	mg/L	45	0.8	0.3	0.6	0.6	0.1	0.7	0.5
Silica, dissolved	mg/L	45	70	25	52	60	13	64	34
Boron, dissolved	mg/L	45	500	20	343	405	113	429	175
Iron, dissolved	ug/L	27	100	10	41	31	30	92	10
Manganese, dissolved	ug/L	-----	-----	-----	-----	-----	-----	-----	-----
Nitrite + nitrate as N, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Nitrate as N, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Nitrate as NO ₃ , dissolved	mg/L	45	18	1.2	12	-----	4.8	-----	-----
Ammonia N, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Organic N, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Phosphorus, total	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Phosphorus, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Fecal coliform	col/100 ml	-----	-----	-----	-----	-----	-----	-----	-----
Fecal streptococci	col/100 ml	-----	-----	-----	-----	-----	-----	-----	-----
Oxygen, dissolved	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
Biochemical oxygen demand (5-day)	mg/L	-----	-----	-----	-----	-----	-----	-----	-----
pH	pH units	47	8.5	7.1	7.8	7.9	0.3	8.2	7.5
Color	Co - Pt units	10	35	3	10	8	9.3	16	5

NORTH PLATTE RIVER BASIN

06681300 Gering Drain at Mitchell-Gering Canal near Gering, Nebr.---Continued

Results of regression analyses relating concentrations of selected chemical constituents to specific conductance (SpC)

Dissolved constituents (mg/L)	No. of measurements	Regression equation	Correlation coefficient	Percent explained variance	Standard error of estimate (mg/L)
Dissolved solids, residue (RDS)	47	RDS = 0.722(SpC) -- 26.197	0.99	99	12
Dissolved solids, sum (SDS)	-----				
Hardness as CaCO ₃ (TH)	47	TH = -0.129(SpC)+300.665	-.48	23	36
Calcium (Ca)	47	Ca = -0.026(SpC)+73.625	*-.28	8.0	13
Magnesium (Mg)	47	Mg = -0.016(SpC)+28.070	-.69	47	2.5
Sodium (Na)	47	Na = 0.301(SpC) - 144.068	.95	90	15
Potassium (K)	47	K = 0.003(SpC) + 8.100	*.27	7.4	1.5
Bicarbonate (HCO ₃)	47	HCO ₃ = 0.403(SpC)- 55.917	.92	84	26
Sulfate (SO ₄)	47	SO ₄ = 0.121(SpC) + 67.822	.69	48	19
Chloride (Cl)	47	Cl = 0.029(SpC) - 6.308	.93	86	1.7
Silica (Si)	45	Si = 0.067(SpC) - 17.679	.78	61	8.3
Nitrite + Nitrate as N (NO ₂ -NO ₃)	-----				

* Not significant at the 95 percent confidence level; the regression equation should not be used to predict the concentration of the dependent variable.

Results of regression analyses relating specific conductance to water discharge (Q)

No. of measurements	Water discharge (ft ³ /s)		Regression equation	Correlation coefficient	Percent explained variance	Standard error of estimate	
	Maximum	Minimum				Log units	Percent
47	170	5.2	SpC = 2032 Q ^{-0.23724}	-0.88	78	0.035	8.1

largely by local point sources of contamination such as feedlots, or nonpoint sources such as fertilized croplands.

Statistics

Water-quality data for specific conductance and for six principal constituents used to determine ionic balance in water and to make geochemical-equilibrium computations are summarized in table 3. Data for dissolved solids, potassium, silica, 2 nutrients, and 13 trace constituents are summarized in table 4. The constituents summarized represent only part of the total number of constituents for which analyses have been performed. Some constituents, such as pesticides, have been measured only a few times; summarizing these data by use of statistics would be meaningless. Temperature and pH data were not summarized for the reasons given in the section "Chemical constituents summarized and evaluated."

Outliers generally are significant in evaluating water-quality data because they indicate unusual hydrologic conditions. For example, of 38 wells completed in

Holocene and Pleistocene aquifers sampled in Lancaster County, specific-conductance values for 16 exceed the 90th-percentile value of 1,070 micromhos per centimeter at 25° Celsius. Some of these wells are close to the City of Lincoln landfill, and the specific conductance of water from them is the result of point-source contamination from the landfill. Some of these wells may be affected by the movement of saline water from underlying Mesozoic and (or) Paleozoic deposits into the Holocene and Pleistocene deposits or by the movement of saline water from Salt Creek into the flood plain alluvium. Sodium, chloride, and sulfate statistical data are also highly skewed as a result of very large concentrations of these constituents in water from the same 16 wells in Lancaster County.

Water-Quality Diagrams

Diagrams in figure 10 represent individual statistical parameters for the quality of water from Holocene and Pleistocene aquifers. For example, the diagram labeled

Table 3. Statistical summary of specific conductance and principal constituents in water from Holocene and Pleistocene aquifers

[N, number of measurements; μmho , micromhos per centimeter at 25° Celsius; mg/L, milligrams per liter]

Property or constituent and unit	N	Maximum	Minimum	Mean	Standard deviation	Median	10th percentile	90th percentile
Specific conductance, μmho -----	1,556	7,010	52	650	496	555	228	1,070
Calcium, dissolved, mg/L-----	1,265	485	1.5	82	52	76	24	130
Magnesium, dissolved, mg/L-----	1,259	160	.4	16	13	13	3.9	30
Sodium, dissolved, mg/L-----	1,445	1,310	.3	32	66	20	6.8	60
Alkalinity as CaCO_3 , mg/L-----	1,287	689	12	213	92	214	76	326
Chloride, dissolved, mg/L-----	1,342	1,680	0	20	79	8.1	1.2	34
Sulfate, dissolved, mg/L-----	1,349	4,300	0	99	220	36	5.1	217

Table 4. Statistical summary of selected additional constituents in water from Holocene and Pleistocene aquifers

[N, number of measurements; mg/L, milligrams per liter, µg/L, micrograms per liter]

Constituent and unit	N	Maximum	Minimum	Mean	Standard deviation
Dissolved solids, residue at 180° Celsius, mg/L-----	860	3,670	56	437	341
Potassium, dissolved, mg/L-----	1,114	66	1.2	8.2	5.4
Silica, dissolved, mg/L-----	1,049	96	.6	39	13
Nitrate + nitrite as N, mg/L---	477	100	0	5.3	10
Phosphorous, dissolved, mg/L---	190	1.2	.01	.15	.15
Boron, dissolved, µg/L-----	1,005	2,300	0	89	116
Iron, dissolved, µg/L-----	560	39,000	0	322	1,865
Manganese, dissolved, µg/L----	392	17,000	0	176	918
Arsenic, dissolved, µg/L-----	97	15	0	5.0	3.8
Barium, dissolved, µg/L-----	64	500	0	177	124
Cadmium, dissolved, µg/L-----	115	9	0	1.2	1.6
Chromium, dissolved, µg/L-----	93	90	0	8.1	13
Copper, dissolved, µg/L-----	328	400	0	7.8	28
Lead, dissolved, µg/L-----	123	46	0	3.3	6.7
Mercury, dissolved, µg/L-----	96	9.0	0	.36	.94
Selenium, dissolved, µg/L-----	162	480	0	9.8	40
Silver, dissolved, µg/L-----	59	2	0	.1	.4
Zinc, dissolved, µg/L-----	310	7,600	0	156	639

"Maximum" indicates the greatest concentration, converted to milliequivalents per liter, detected in any of the samples from these aquifers for each of the constituents for which it is constructed. Accordingly, these diagrams are composites of many analyses rather than representations of individual analyses; this represents a departure from the traditional use of this type of diagram.

Traditionally, diagrams such as these are constructed from individual analyses with the result that a balance exists between ion concentrations on the two sides of the vertical axis. The cations (calcium, magnesium, and sodium plus potassium) to the left of the axis ordinarily are balanced by the anions (bicarbonate plus carbonate, sulfate, and chloride) to the right. Units are milliequivalents per liter, which represent actual combining ratios of constituents. They are derived by dividing constituent concentration, in milligrams per liter, by a factor composed of the molecular weight of a constituent divided by its oxidation state.

The procedure used to construct these diagrams was similar to that just described, but because each diagram represents only one aspect, such as maximum, of the entire set of water-quality data, concentrations of constituents on one side of the vertical axis may not balance those on the other. Nevertheless, these diagrams provide

a useful means of examining median and percentile water-quality types, of examining the ways that outlying values affect overall water-quality types, and of examining the variability in water quality as shown by outlier values. They also may be useful in identifying aquifer source if the source is uncertain.

From the diagrams, it can be seen that water in Holocene and Pleistocene deposits is nearly always of the calcium bicarbonate type. In only a few analyses, mostly of water affected by man's activities, do ions other than calcium and bicarbonate predominate. Specific conductance is less than 1,000 µmho/cm in nearly 90 percent of all water samples from Holocene and Pleistocene aquifers. Considering the relative abundance of calcium in soils and the ease of conversion of carbon dioxide to bicarbonate in Nebraska soils, it is reasonable that calcium bicarbonate should be the predominant chemical type of most near-surface ground water in Nebraska.

The individual water sample that had the maximum specific conductance of 7,010 µmho/cm also had the maximum sodium and sulfate concentrations. Many wells in northern Nebraska, including the well from which this sample was collected, are developed in very shallow basal sands and gravels resting directly on bedrock of the Pierre Shale. Where basal sand and gravel deposits are thin so that recharge to wells is small, wells sometimes are drilled into the shale to provide a storage reservoir. Water from the basal sand and gravel that accumulates in such reservoirs often dissolves high concentrations of soluble constituents from the shale. This combination of circumstances seems to account for high specific conductances and high concentrations of sodium and sulfate in water from several wells in Dawes and Boyd Counties.

Dissolved Solids

A well producing from Pleistocene deposits in the sandhills in Cherry County yielded water having the minimum dissolved-solids concentration of 56 milligrams per liter (mg/L). A well producing from Holocene deposits in Lancaster County, but affected by the movement of saline water from Paleozoic or Mesozoic deposits into the alluvial deposits, yielded water having the maximum dissolved-solids concentration of 3,670 mg/L.

Water having dissolved-solids concentrations more than 2,250 mg/L occurs only in part of Lancaster County (fig. 11). Water having dissolved-solids concentrations from 751 to 2,250 mg/L occurs in small areas widely distributed throughout the State. These include areas underlain by alluvium in the South Platte, central Platte, and Republican River valleys. During certain times of the year, the South Platte River carries return flow from extensively irrigated areas upstream. During these times, South Platte River water is the most mineralized

Table 5. Statistical summary of specific conductance and principal constituents in water from Tertiary aquifers[N, number of measurements; μmho , micromhos per centimeter at 25° Celsius; mg/L, milligrams per liter]

Property or constituent and unit	N	Maximum	Minimum	Mean	Standard deviation	Median	10th percentile	90th percentile
Ogallala Formation								
Specific conductance, μmho -----	457	1,380	84	422	190	440	181	652
Calcium, dissolved, mg/L-----	411	160	7.8	56	29	60	22	99
Magnesium, dissolved, mg/L-----	411	62	.8	11	6.2	12	3.3	17
Sodium, dissolved, mg/L-----	431	186	3.1	13	14	10	6	18
Alkalinity as CaCO_3 , mg/L-----	373	434	21	170	77	183	66	290
Chloride, dissolved, mg/L-----	390	340	.3	8.3	23	4.0	1.0	14
Sulfate, dissolved, mg/L-----	389	311	.3	25	40	17	4.0	43
Arikaree Group								
Specific conductance, μmho -----	31	495	273	371	65	367	299	465
Calcium, dissolved, mg/L-----	37	72	28	47	10	46	36	59
Magnesium, dissolved, mg/L-----	37	20	4.7	10	3.5	9.8	7.4	15
Sodium, dissolved, mg/L-----	32	54	5.0	17	12	13	7.1	33
Alkalinity as CaCO_3 , mg/L-----	37	267	120	161	30	156	130	200
Chloride, dissolved, mg/L-----	42	31	1.1	6.2	5.9	4.7	2.0	12
Sulfate, dissolved, mg/L-----	42	91	3.0	21	18	15	5.2	43

Table 5. Statistical summary of specific conductance and principal constituents in water from Tertiary aquifers—Continued

Property or constituent and unit	N	Maximum	Minimum	Mean	Standard deviation	Median	10th percentile	90th percentile
Brule Formation								
Specific conductance, μmho -----	28	1,030	245	463	187	427	313	612
Calcium, dissolved, mg/L-----	46	100	2.0	43	22	49	24	66
Magnesium, dissolved, mg/L-----	31	20	.2	9.9	4.8	11	5.3	14
Sodium, dissolved, mg/L-----	26	129	5.5	37	30	24	14	74
Alkalinity as CaCO_3 , mg/L-----	31	602	99	200	90	189	146	232
Chloride, dissolved, mg/L-----	46	195	1.1	21	34	9	5	29
Sulfate, dissolved, mg/L-----	46	400	1.8	69	78	17	10	140
Chadron Formation								
Specific conductance, μmho -----	10	2,000	764	1,374	504	1,410	781	1,752
Calcium, dissolved, mg/L-----	9	27	5.2	14	9	12	5.3	26
Magnesium, dissolved, mg/L-----	9	8.9	1.5	3.4	2.2	2.6	1.5	6.6
Sodium, dissolved, mg/L-----	11	422	89	267	128	293	110	376
Alkalinity as CaCO_3 , mg/L-----	12	494	148	322	99	343	199	395
Chloride, dissolved, mg/L-----	11	420	14	172	139	182	23	308
Sulfate, dissolved, mg/L-----	12	197	1.0	72	64	61	9.0	150

Table 6. Statistical summary of selected additional constituents in water from Tertiary aquifers

[N, number of measurements; mg/L, milligrams per liter; µg/L, micrograms per liter]

Constituent and unit	N	Maximum	Minimum	Mean	Standard deviation
Dissolved solids, residue at 180° Celsius, mg/L-----	278	1,190	61	301	155
Potassium, dissolved, mg/L-----	437	38	.5	8.3	3.9
Nitrate + nitrite as N, mg/L----	321	76	.01	3.2	6.4
Phosphorus, dissolved, mg/L-----	103	.28	.01	.07	.06
Silica, dissolved, mg/L-----	433	76	5.1	53	11
Boron, dissolved, µg/L-----	390	2,200	.0	110	232
Iron, dissolved, µg/L-----	221	3,100	.0	78	260
Manganese, dissolved, µg/L-----	206	1,000	.0	39	110
Arsenic, dissolved, µg/L-----	107	27	1.0	6.6	3.9
Barium, dissolved, µg/L-----	27	500	100	211	128
Cadmium, dissolved, µg/L-----	91	3.0	.0	.7	1.0
Chromium, dissolved, µg/L-----	106	20	.0	8.1	9.9
Copper, dissolved, µg/L-----	147	75	.0	4.1	9.4
Lead, dissolved, µg/L-----	107	23	.0	1.7	3.9
Mercury, dissolved, µg/L-----	107	1.3	.0	.2	.2
Selenium, dissolved, µg/L-----	145	25	1.0	2.0	2.7
Silver, dissolved, µg/L-----	18	.0	.0	0	0
Zinc, dissolved, µg/L-----	148	.0	.0	82	451

is available. Further study of Tertiary deposits in Nebraska needs to include studies of the water quality of these deposits.

Calcium

Calcium concentrations greater than 100 milligrams per liter (mg/L) have been detected only in a small area near the North Loup River in Valley and Greeley Counties and in an even smaller area in Nance County. Concentrations are less than 25 mg/L in water from Tertiary aquifers throughout the sandhills. Elsewhere they range from 25 to 100 mg/L.

Calcium, a principal cause of hardness in water, is common in igneous and sedimentary rocks. Limestone is an important source of calcium, as are the calcareous sands and sandstones in the Ogallala Formation. Concentrations of calcium in ground water are regulated strictly by mineral solubility and chemical equilibria. Calcium is thought to be the principal cation in those areas labeled "Insufficient data" in figure 18.

Alkalinity

Alkalinity, expressed as an equivalent concentration of calcium carbonate, generally is significantly less than 100 milligrams per liter (mg/L) in ground water of the Sand Hills Region (fig. 19). Alkalinity greater than 300

mg/L is found in water from the Ogallala Formation in Greeley, Howard, and Valley Counties and in water from the Chadron and Brule Formations in Dawes, Deuel, Sheridan, and Sioux Counties.

Bicarbonate ion, the principal source of alkalinity, is the principal anion in water from all four Tertiary aquifers, although sulfate occurs in nearly equal milliequivalent concentrations in water from the Chadron Formation. Bicarbonate in water from aquifers of Tertiary age is formed by the reaction of carbon dioxide dissolved in infiltrating water with basic material in the soil and by the solution of carbonaceous material from the formation from which the water is derived. Other anions derived from the solution of weak acids may contribute to alkalinity, but their contributions usually are very small compared to that of bicarbonate. When the pH of water is greater than 8.3, measurable concentrations of carbonate exist in solution in equilibrium with bicarbonate.

Small amounts of alkalinity in water from the Ogallala Formation in the Sand Hills Region probably reflect the lack of soluble carbonaceous material in the siliceous soils and subsoils of the region. Large amounts of alkalinity in water from the Chadron Formation in Dawes, Deuel, Sheridan, and Sioux Counties are related to low calcium concentrations. Calcium concentrations tend to control the amount of alkalinity in water by controlling concentrations of bicarbonate and carbonate that can exist in solution under equilibrium conditions. Because calcium concentrations are small in water from the Chadron Formation compared to those in water from the other Tertiary aquifers, alkalinities tend to be greater.

Data available are insufficient to map alkalinity in Tertiary deposits in the Republican River basin in southwestern Nebraska and along most of the eastern boundary of the deposits.

Sulfate

Concentrations of sulfate generally are less than 10 milligrams per liter (mg/L) (fig. 20) in ground water of the Sand Hills Region because no extensive source of sulfate exists in this area. Concentrations of sulfate exceeding 100 mg/L occur in water from Tertiary aquifers in the upper North Platte River Valley and in the Platte River Valley east of the confluence of the North Platte and South Platte Rivers. Although data available are insufficient to map sulfate concentrations in the lower North Platte and the South Platte River Valleys, concentrations of sulfate in water from Tertiary aquifers underlying these areas probably exceed 100 mg/L also. Wells throughout the Platte River valley produce water from aquifers and receive recharge from the river system, canals, and reservoirs. Concentrations of sulfate in the Platte River system exceed 100 mg/L during all periods except floods.



Hoskins • Western • Sonderegger, Inc.
P.O. Box 80358 825 J Street
Lincoln, Nebraska 68501
402/475-4241

August 27, 1984

RECEIVED

AUG 29 1984

Nebraska Department of Environmental Control
Box 94877, State House Station
301 Centennial Mall South
Lincoln, Nebraska 68509

**DEPARTMENT OF
ENVIRONMENTAL CONTROL**

ATTENTION: Mike Steffensmeier, Acting Chief
Hazardous Waste Management Section

REFERENCE: Lockwood Corporation Case No. 756
Status Report on Hydrogeologic Investigation

Dear Mr. Steffensmeier:

A preliminary hydrogeologic investigation has been performed at Lockwood Corporation, Gering, Nebraska. The investigation is in response to Nebraska Department of Environmental Control, Administrative Order of June 20, 1984, item 3.

An extension was requested and received with deadline set at August 27th, 1984. This letter represents the status report of findings and conclusions to date concerning the groundwater setting in and about the Lockwood spent acid lagoons.

The purpose of the investigation were to determine 1) if toxic levels of leachable metals had reached the aquifer 2) if so, the nature of the metals excursion and 3) remedial action for aquifer restoration.

Included in the investigation are the following items:

1. Review of existing soil and geologic reports and review of registered well logs.
2. A subsurface investigation by auger borings at the site according to ASTM Designation D 1452-65 (Revised 1980) and sampling with split-barrel sampler according to ASTM Designation D 1586-67, Groundwater sampling in bore holes by PVC bailer according to ASTM Designation D 3370.
3. Analysis of groundwater samples include cadmium, chromium, zinc, iron, sulfates in mg/l and the parameters: temperature, pH and specific conductance.

Please find attached Sheet 1, a boring plan for the site, Table 1, Analysis of Lagoon and Groundwater Samples compiled from NDEC Investigation Report dated April 18, 1984 and HWS laboratory analysis of August 15, 1984. These documents are preliminary and subject to addition and revision in the final report.

PRELIMINARY FINDINGS

The results of a preliminary subsurface investigation within 150 radial feet of the spent acid lagoons revealed a three unit aquifer consisting of a upper unit (1) of silty and sandy clay ranging in thickness from 7.0 ft to 10.0 ft; a sand and gravel unit (2) composed of a combination of siliceous and carbonate grains and a silty clay/ gravelly clay unit (3) the weathered surface of the Brule Formation. Unit 2 ranges in thickness from 10 ft to 12 ft and contained interbedded silty and sandy clays. Unit 3 acts as an aquitard at the site and was penetrated at each boring at a depth of between 19.5 ft and 25.0 ft.

Groundwater occurrence at the site is unconfined in unit 2 and semiconfined to confined in the Brule Formation underlying the weathered unit 3. Flow in unit 2 is regionally toward the North Platte River but locally north to south. This flow results from recharge at the north property boundary by an irrigation canal and discharge to the south by the Gering Drain. Flow in the Brule Fm. was not assessed.

Local wells including the Gering Municipal Well #77-1 and several registered irrigation wells all are deeply penetrating the Brule Fm. This is the consequence of low transmissivity in this aquifer unit.

Groundwater quality in the Brule Fm. is variable but generally calcium bicarbonate and sodium bicarbonate according to U.S. Geologic Survey Water-Supply Paper 943, 1946. Nebraska Department of Health records indicate the Gering Municipal well has sodium-bicarbonate type water. We requested sampling of this well on 8/6/84 and testing specifically for chromium.

The preliminary groundwater analysis results are as follows:

1. Chromium concentrations range from <0.05 mg/l to 0.15 mg/l within 150 radial ft of the lagoons.
2. Chromium concentration diminishes significantly away from the lagoons in areas of occurrence. (see Table 1 and Sheet 1)
 - a. B-8, cr = 0.15 mg/l to B-11, cr = 0.10 mg/l; separation = 120 ft
 - b. B-1, cr = 0.10 mg/l; B-9 cr 0.05 mg/l; separation 48 ft
3. Groundwater conditions are alkaline and suitable to precipitation of chromium from solution as a salt.
4. Zinc concentrations range from 0.01 mg/l to 1.31 mg/l.

5. Additional borings and sampling at greater radial separation will be necessary to determine the furthest occurrence of chromium from the lagoons.
6. Lack of etching on carbonate grains in units 1 and 2 indicate alkaline conditions and not acid corrosion of the grains.

CONCLUSIONS & RECOMMENDATIONS

Our conclusions are based on a limited number borings. We are currently extending the radius of investigation in all directions and expect to have the results of groundwater sample analysis in two to four weeks time.

Based on data to date we have made the following conclusions:

1. Lagoon leakage occurred in the north pond in association with clay liner erosion at the terminus of the discharge pipe.
2. Naturally high alkalinity provides a groundwater environment suitable for precipitation of heavy metals.
3. Dilution and/or precipitation of chromium from groundwater occurs within the immediate vicinity of the lagoons. Further investigation is in progress to determine the concentration gradient.
4. Zinc and cadmium, although present at high concentrations in the pond sludges, precipitate out of infiltrating solutions in the alkaline soil and groundwater.
5. Absence of etching on carbonate grains indicate decay of the infiltrating spent acid front to normal or alkaline pH in the upper few inches to feet of the underlying soils. This is consistent with the SCS soil survey of Scotts Bluff County - 1968 which indicates the pre-site conditions as a wet variant of the Mitchell Silt loam and "scabby". This was a natural groundwater discharge site and as a result had developed a high concentration of salts prior to use due to evaporation.

We recommend the following actions:

1. Complete the subsurface investigation at 200 to 250 radial feet from the ponds.
2. Instigate closure of the spent acid lagoons.
3. Install four (4) groundwater monitoring wells fully penetrating unit 2. Sample these wells on a quarterly basis for 1 year and test the samples for the presence of chromium cadmium, zinc, iron, sulfates, pH and specific conductance. If at the end of one year, no evidence exists of significant increase in these constituents or changes in the parameters reduce monitoring to biannual for two additional years. Location and design of the wells will be submitted at completion of the investigation.

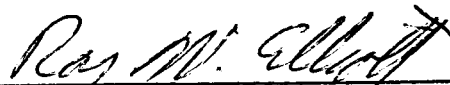
4. If spent acid liquors are to be disposed of at this facility repair of the clay liner or construction of lined evaporation pond will be appropriate for protection of the groundwater.

We respectfully request your permission to extend the date of completion of the hydrogeologic investigation to September 24, 1984.

Sincerely,

HOSKINS-WESTERN-SONDEREGGER, INC.

By



Roy W. Elliott

Certified Professional Geologist #6684

RWE/vm

84/3936

Enclosure

1 cc: Ray Dugan, General Foreman
Lockwood Corp.

1 cc: Gary Brandt

RECEIVED

AUG 29 1984

Table 1 Analysis of Lagoon & Groundwater Samples

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Parameters	Recommended Concentration Limit (mg/l)	Municipal Well #6 4/18/84	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11
			(6/29/84)										
Arsenic	0.05	0.014	-----N.A.-----										
Lead	0.05	0.013	-----N.A.-----										
Zinc	5.0	0.012	<0.01	1.13	1.31	0.15	0.02	0.04	<0.01	<0.01	0.03	0.05	0.03
Chromium	0.05	0.006	<0.01	<0.05	NA	<0.05	<0.05	0.12	0.10	0.15	<0.05	<0.05	0.10
Cadmium	0.01	0.002*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	0.05	0.005*	-----Not Assessed-----										
Selenium	0.01	0.005	-----Not Assessed-----										
Chromium VI	0.05	0.003'	-----Not Assessed-----										
pH	NA	7.5	8.3	NA	8.7	8.6	8.4	8.5	8.6	8.5	8.2	7.9	8.2
Specific Conductance			1200	NA	3100	3200	4100	2450	2800	2100	1600	8200	1750
Sulfates			915	NA	1183	1012	508	NA	375	234	323	1295	349
Iron			1.69	3.87	1.95	1.88	1.89	0.82	2.13	<0.01	0.47	0.40	0.41

* At or below detection limit
' Not detected

COMPLETE INFORMATION BELOW:

WATER CHEMISTRY

STATE
LAB
NO.

153-816

DATE COLLECTED Feb 2 1983
(MO) (DAY) (YR) (HOUR)SAMPLE COLLECTED BY Mr. EdwardsSAMPLE LOCATION 36-TH St Rg 56
Southwest of Gering, Neb.COPIES TO ENVIRONMENTAL ENGINEERING
SCOTTsbluff, Ne.

THIS LAB REPORT IS TO BE MAILED TO:

PLEASE
PRINT
COMPLETE
ADDRESSSteve Edwards
RT-2 1507 241
Gering, Nebr.
69341STATE OF NEBRASKA DEPARTMENT OF HEALTH LABORATORIES
3701 SOUTH 14TH, LINCOLN, NE 68502

CHECK TESTS REQUESTED

☒ ALL TESTS BELOW ☒ pH 7.3

☒ CALCIUM 101 mg/l ☒ MANGANESE 4.1 mg/l

☒ CHLORIDE 238 mg/l ☒ NITRATE-N 0.1 mg/l

☐ FLUORIDE 60 mg/l ☒ SODIUM 122 mg/l

☒ IRON 0.1 mg/l ☒ SULFATE 102 mg/l

☒ TOTAL ALKALINITY 284 mg/l as CaCO₃

☒ TOTAL HARDNESS 356 mg/l as CaCO₃

☒ TOTAL DISSOLVED SOLIDS 950 mg/l

NOT TESTED BECAUSE OF: ☐ DAMAGE☐ INSUFFICIENT AMOUNT ☐ IMPROPER CONTAINERTESTS BY: APCOPIY

FOR DEPARTMENTAL USE ONLY

FOR ACCOUNTING USE ONLY:

LRWC81

83 MAR -3 AM 83 MAR 18 AM 83

COMPLETE INFORMATION BELOW:

REPORT ON WATER MICROBIOLOGY

STATE
LAB
NO.

1080

DATE COLLECTED 4 25 83 2:30 P.
(MO) (DAY) (YR) (HOUR)SAMPLE COLLECTED BY Jerry CarpenterSAMPLING LOCATION T - 6 Hall

COPIES TO _____

MAIL RESULTS TO: (PLEASE PRINT COMPLETE ADDRESS)

City Of Gering

1450 10th

Gering, Ne. 69341

FOR LAB USE ONLY
SAMPLE CONDITION

☐ GOOD ☐ DAMAGED ☐ INSUFFICIENT ☐ OLD

☐ OTHER _____

☐ TOTAL COLIFORMS _____ PER 100 ML

PROCEDURE

☒ MEMBRANE FILTER

☐ MPN

COPY

TEST(S) BY: APCOPIY

COLIFORM PURITY TEST FOR DRINKING WATER:

☒ THE WATER MEETS BACTERIOLOGICAL STANDARD

☐ THE WATER DOES NOT MEET BACTERIOLOGICAL STANDARD

STATE OF NEBRASKA DEPARTMENT OF HEALTH LABORATORIES, 3701 SOUTH 14th, LINCOLN, NE 68502

CONTROL NO

LABORATORY EXAMINATION

STATE OF NEBRASKA DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES
Central: P. O. Box 2755, Lincoln 68502
Western: P. O. Box 1192, Scottsbluff 69361

Tom

IDENTIFICATION OF SAMPLE

City

EXAMINATION REQUESTED:

CHEMICAL EXAMINATION OF WATER

COPY TO:

REPORT TO: Johnie Morgan

ADDRESS: 1450 10th St. 1450 10th St.

CITY: Gering NEBRASKA ZIP: 69341

DATE COLLECTED 3-2-78

DATE RECEIVED 3-7-78

DATE REPORTED 3-9-78

LAB. NO. 3-15-M

TOTAL ALKALINITY 376 ppm as CaCO_3
TOTAL HARDNESS 140 ppm as CaCO_3 pH 8.0
SPECIFIC CONDUCTIVITY μ mho (equivalent to ppm solids)
TOTAL DISSOLVED SOLIDS 912 ppm
SODIUM 239 ppm Na FLUORIDE .67 ppm F
CALCIUM 35 ppm Ca CHLORIDE 76 ppm Cl
IRON nil ppm Fe SULFATE 255 ppm SO_4
MANGANESE nil ppm Mn NITRATE 6.2 ppm as N

25 R74

LABORATORY EXAMINATION

STATE OF NEBRASKA DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES
Central: P. O. Box 2755, Lincoln 68502
Western: P. O. Box 1192, Scottsbluff 69361

NOTIFICATION OF SAMPLE

City

EXAMINATION REQUESTED:

CHEMICAL EXAMINATION OF WATER

COPY TO: _____

DATE COLLECTED 3-2-78REPORT TO: Johnie MorganDATE RECEIVED 3-7-78ADDRESS 1450 10th St.DATE REPORTED 3-9-78CITY Gering NEBRASKA ZIP 69341LAB. NO. 3-15-M

TOTAL ALKALINITY 380 ppm as CaCO_3
TOTAL HARDNESS 140 ppm as CaCO_3 pH 8.1
SPECIFIC CONDUCTIVITY _____ μ mho (equivalent to _____ ppm solids)
TOTAL DISSOLVED SOLIDS 828 ppm
SODIUM 220 ppm Na FLUORIDE .60 ppm F
CALCIUM 35 ppm Ca CHLORIDE 64 ppm Cl
IRON nil ppm Fe SULFATE 260 ppm SO_4
MANGANESE nil ppm Mn NITRATE 6.4 ppm as N

[Signature]
L. S. R74

IDENTIFICATION OF SAMPLE

City

EXAMINATION REQUESTED:

CHEMICAL EXAMINATION OF WATER

COPY TO: _____

REPORT TO: Johnie Morgan

ADDRESS 1450 10th St.

CITY Gering NEBRASKA ZIP 69341

DATE COLLECTED 3-2-78

DATE RECEIVED 3-7-78

DATE REPORTED 3-9-78

LAB. NO. 3-14-M

TOTAL ALKALINITY 380 ppm as CaCO_3
TOTAL HARDNESS 136 ppm as CaCO_3 pH 8.1
SPECIFIC CONDUCTIVITY _____ μ mho (equivalent to _____ ppm solids)
TOTAL DISSOLVED SOLIDS 984 ppm
SODIUM 223 ppm Na FLUORIDE .63 ppm F
CALCIUM 30 ppm Ca CHLORIDE 78 ppm Cl
IRON nil ppm Fe SULFATE 255 ppm SO_4
MANGANESE nil ppm Mn NITRATE 6.0 ppm as N

[Signature]
25 R74

LABORATORY EXAMINATION

STATE OF NEBRASKA DEPARTMENT OF HEALTH
DIVISION OF LABORATORIESCentral: P. O. Box 2755, Lincoln 68502
Western: P. O. Box 1192, Scottsbluff 69361

Tom

IDENTIFICATION OF SAMPLE

City

EXAMINATION REQUESTED:

CHEMICAL EXAMINATION OF WATER

COPY TO: _____

REPORT TO: Johnie MorganADDRESS 1450 10th St.CITY Gering NEBRASKA ZIP 69341DATE COLLECTED 3-3-78DATE RECEIVED 3-7-78DATE REPORTED 3-9-78LAB. NO. 3-17-M

TOTAL ALKALINITY

380 ppm as CaCO_3

TOTAL HARDNESS

148 ppm as CaCO_3 pH 8.0

SPECIFIC CONDUCTIVITY

 μ mho (equivalent to
ppm solids)

TOTAL DISSOLVED SOLIDS

912 ppm

SODIUM

180 ppm Na

FLUORIDE

60 ppm F

CALCIUM

38 ppm Ca

CHLORIDE

52 ppm Cl

IRON

nil ppm Fe

SULFATE

280 ppm SO_4

MANGANESE

nil ppm Mn

NITRATE

6.2 ppm as N

D-25 R74

[illegible]

CONTINUED ON NEXT PAGE

WATER QUALITY ANALYSIS CONTINUED
LAB ID # 179043 RECORD # 11989

SAMPLE LOCATION: 229 55211000 1
STATION ID: 415325103392491 LAT.LONG.SEQ.: 415325 1033925 01
DATE OF COLLECTION: BEGIN--7/06 END-- TIME--

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	94	4.691	BICARBONATE	290	4.754
MAGNESIUM DISS	24	1.975	CARBONATE	0	0.000
POTASSIUM DISS	17	0.435	CHLORIDE DISS	16	0.452
SODIUM DISS	78	3.393	FLUORIDE DISS	0.6	0.032
			SULFATE DISS	220	4.551
			NO2+NO3 AS N D	4.3	0.307
TOTAL		10.493	TOTAL		10.123

PERCENT DIFFERENCE = 1.79

EQUIVALENT TO 3.420 STANDARD ANALYSIS
GROUND WATER ANALYSIS FOR WELL 22N 55W11DDC
USGS OBS WELL NR SCOTTSB LUFF NEBR

***** PRELIMINARY DATA
Q-9410 STATE 31 COUNTY 79

DATE OF COLLECTION 111770 SAMPLE DEPTH . FEET COMPUTATION DATE AF

POINT OF COLLECTION END OF HOSE APPEARANCE CLEAR COLLECTED BY
DEPTH-30.9 FT WATER LEVEL 24.4 FT SAMPLED AFTER PUMPING 1 HR YIELD 10

	MG/L	MEQ/L		MG/L	MEQ/L	
SILICA	52.2		BICARBONATE	320.	5.24	CONDUCTIVITY
ALUMINUM UG/L	57.40		CARBONATE	0.	0.0	ALK,TOT (MG/L)
IRON UG/L	8.97		ALK AS CO3	157.		PHOS ORTHO (M
MANGANESE UG/L	11.00		SULFATE	232.5	4.84	P DISS (MG/L)
CALCIUM	102.5	5.11	CHLORIDE	18.2	0.51	NONCARB HARDN
MAGNESIUM	25.8	2.12	FLUORIDE	0.5	0.02	WATER TEMP (C
STRONTIUM UG/L	940.00	0.02	NITRATE (NO3)	15.7	0.25	COLOR
SODIUM	83.0	3.61	DIS O-PO4 (PO4)	0.08		P TOTAL (MG/L)
POTASSIUM	8.7	0.22	BORON UG/L	122.83		ARSENIC
LITHIUM UG/L	40.00	0.01				BERYLLIUM UG/
TOTAL CATIONS		11.09	TOTAL ANIONS		10.87	TOT CHROMIUM
PERCENT ERROR	1.01					COPPER
						MOLYBDENUM UG
						SELENIUM AS S
						VANADIUM UG/L
						DISSOLVED SOL
						CAL DISSOLVED

PERCENT REACTING VALUES

CALCIUM	46.11
MAGNESIUM	19.09
SODIUM	32.55
POTASSIUM	2.01
LITHIUM	0.05
STRONTIUM	0.19

	100.00

CARBONATE	0.0
BICARBONATE	48.19
SULFATE	44.54
CHLORIDE	4.72
FLUORIDE	0.23
NITRATE	2.33

PRELIMINARY DATA SUBJECT TO REVISION *****
ATE 31 COUNTY 79 LATITUDE LONGITUDE

IMPUTATION DATE APRIL 20, 1971

COLLECTED BY BOB HANSEN

1 HR YIELD 10 G M GOOD WELL CHEMIST-HOY 3-23-71/3-31-71

EQ/L

CONDUCTIVITY	951.09	PH	7.60
ALK,TOT (MG/L CaCO_3)	262.07	NITRATE (MG/L N)	3.54
PHOS ORTHO (MG/L P)	0.03	DISS P (MG/L PO_4)	0.14
P DISS (MG/L P)	0.05	TOTAL HARDNESS	361.65
NONCARB HARDNESS	99.58	SAR	1.90
WATER TEMP (DEG F)	55.00	WATER TEMP (DEG C)	12.78
COLOR	2.00	AMMONIA (MG/L AS N)	0.01
P TOTAL (MG/L P)	0.05	MERCURY DISS HG UG/L	0.00
ARSENIC UG/L	0.00	BARIUM UG/L	0.00
BERYLLIUM UG/L AS BE	0.00	CADMIUM UG/L	0.00
TOT CHROMIUM UG/L	0.00	COBALT UG/L	0.00
COPPER UG/L	13.00	LEAD UG/L	0.00
MOLYBDENUM UG/L	1.00	NICKEL UG/L	0.00
SELENIUM AS SE UG/L	16.00	SILVER AS AG UG/L	1.00
VANADIUM UG/L	15.00	ZINC UG/L	80.00
DISSOLVED SOLIDS	697.00	D. S./COND RATIO	0.73
CAL DISSOLVED SOLIDS	697.60		

SILICA EXCEEDS 50 MG/L OR LESS THAN 5 MG/L

EQUIVALENT TO 3.420 STANDARD ANALYSIS

***** PRELIMINARY DATA

APPENDIX B

HOSKINS-WESTERN-SONDEREGG, INC.
ENGINEERS-ARCHITECTS-PLANNERS
P. O. BOX 80358 826 J STREET
LINCOLN, NEBRASKA 68501

RECEIVED

LETTER OF TRANSMITTAL

MAR 07 1986

(402) 475-4241

DEPARTMENT OF
ENVIRONMENTAL CONTROL

TO

Nebr. Dept of Environmental
Control, Engineering Division
301 Centennial Mall So.
Lincoln, NE. 68508

DATE	Mar 5, 1986	JOB NO.	84/3936-08
ATTENTION	Mr. R. Schlenker		
RE:	LOCKWOOD CORPORATION - MONITORING WELL LABORATORY RESULTS		

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

- | | | | | |
|---|---------------------------------------|--------------------------------|----------------------------------|---|
| <input type="checkbox"/> Shop drawings | <input type="checkbox"/> Prints | <input type="checkbox"/> Plans | <input type="checkbox"/> Samples | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Copy of letter | <input type="checkbox"/> Change order | <input type="checkbox"/> _____ | | |

COPIES	DATE	NO.	DESCRIPTION
1			WESTERN LABORATORY TEST RESULTS MONITORING WELLS MI-1, MI-2 & MI-1 thru MI-8.

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|---|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Resubmit _____ copies for approval |
| <input checked="" type="checkbox"/> For your use | <input type="checkbox"/> Reviewed as noted | <input type="checkbox"/> Submit _____ copies for distribution |
| <input checked="" type="checkbox"/> As requested | <input type="checkbox"/> Returned for corrections | <input type="checkbox"/> Return _____ corrected prints |
| <input type="checkbox"/> For review and comment | <input type="checkbox"/> _____ | |
| <input type="checkbox"/> FOR BIDS DUE _____ 19 _____ <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US | | |

REMARKS

MR. SCHLENKER:

The attached laboratory results are being
furnished to you at the request of Mr.
Ray Dugan of Lockwood Corporation.

COPY TO

Mr. R. Dugan - Lockwood
D. Kuhlmann - HWS

For HWS

SIGNED:

By Gary C. Brandt

WESTERN LABORATORIES
ANALYTICAL SERVICES

RECEIVED

Telephone (402) 475-4241

MAR 07 1986

825 J Street

P.O. Box 80358

Lincoln, Nebraska 68501

DEPARTMENT OF
ENVIRONMENTAL CONTROL

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: MI-1

LABORATORY IDENTIFICATION NO.: 20025

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	2300	Field	RW
pH	S.U.	7.1	Field	RW
Temperature	°C	13.5	Field	RW
Depth to Water	Ft.	8.6	Field	RW
Metals, Dissolved				
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	<0.05		RW
Lead	mg/L	<0.1		RW
Zinc	mg/L	0.295		RW
Iron	mg/L	0.26		RW
Manganese	mg/L	0.90		RW
Sodium	mg/L	203		RW
Metals, Total				
Arsenic	mg/L	0.005		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	<0.05		RW
Iron	mg/L	1.07		RW
Lead	mg/L	<0.1		RW
Mercury	mg/L	<0.0002		RW
Selenium	mg/L	<0.002		RW
Silver	mg/L	0.02		RW
Sodium	mg/L	260		RW
Zinc	mg/L	0.317		RW
Manganese	mg/L	1.08		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	32	50/86001	SS
Fluoride	mg/L	0.4 low	55/86001	SS
Nitrate-Nitrogen	mg/L	8.2	59/86002	SS
Sulfate	mg/L	700	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	6, 7, 6, 6	608/20	WI
Phenolics	mg/L	<0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	22,20,24,30	549/75-79	WI
Radiochemistry				
Gross Alpha	pCi/L	5±10	8871-21073-10	AL
Gross Beta	pCi/L	50±10	8871-21073-10	AL
Radium 226	pCi/L	0.4±0.8	8871-21073-10	AL
Pesticides				
Endrin	ug/L	<0.5	85-7/11	PM
Lindane	ug/L	<0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	*		
2, 4, 5 - TP	ug/L	*		
Microbiological				
Total Coliforms	Colonies/100 ml	<1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS

1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: MI-2

LABORATORY IDENTIFICATION NO.: 20026

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1340	Field	RW
pH	S.U.	7.6	Field	RW
Temperature	°C	13.5	Field	RW
Depth to Water	Ft.	8.0	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.042		RW
Iron	mg/L	< 0.03		RW
Manganese	mg/L	0.38		RW
Sodium	mg/L	175		RW
Metals, Total				
Arsenic	mg/L	0.017		RW
Barium	mg/L	0.2		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	1.73		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	0.03		RW
Sodium	mg/L	212		RW
Zinc	mg/L	0.050		RW
Manganese	mg/L	0.40		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	13	50/86001	SS
Fluoride	mg/L	0.4	55/86001	SS
Nitrate-Nitrogen	mg/L	6.4	59/86002	SS
Sulfate	mg/L	220	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	5, 4, 5, 5	608/20-21	WI
Phenolics	mg/L	< 0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	26,17,17,19	549/79-80	WI
Radiochemistry				
Gross Alpha	pCi/L	44±13	8871-21073-10	AL
Gross Beta	pCi/L	37±7	8871-21073-10	AL
Radium 226	pCi/L	1.8±1.2	8871-21073-10	AL
Pesticides				
Endrin	ug/L	< 0.5	85-7/11	PM
Lindane	ug/L	< 0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	*		
2, 4, 5 - TP	ug/L	*		
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986
AUTH.: HWS 84/3936
REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-1

LABORATORY IDENTIFICATION NO.: 20027

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	2800	Field	RW
pH	S.U.	7.0	Field	RW
Temperature	°C	14.0	Field	RW
Depth to Water	Ft.	8.3	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.399		RW
Iron	mg/L	4.3		RW
Manganese	mg/L	2.5		RW
Sodium	mg/L	148		RW
Metals, Total				
Arsenic	mg/L	0.002		RW
Barium	mg/L	0.2		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	5.2		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	0.11		RW
Sodium	mg/L	157		RW
Zinc	mg/L	0.387		RW
Manganese	mg/L	2.5		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	26	50/86001	SS
Fluoride	mg/L	0.4	55/86001	SS
Nitrate-Nitrogen	mg/L	1.4	59/86002	SS
Sulfate	mg/L	1050	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	5, 4, 4, 4	608/21	WI
Phenolics	mg/L	< 0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	18,22,22,19	549/79-80	WI
Radiochemistry				
Gross Alpha	pCi/L	40±18	8871-21073-10	AL
Gross Beta	pCi/L	30±10	8871-21073-10	AL
Radium 226	pCi/L	2.5±1.8	8871-21073-10	AL
Pesticides				
Endrin	ug/L	< 0.5	85-7/11	PM
Lindane	ug/L	< 0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	< 5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	< 5.0	85-7/11	PM
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

By SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-2

LABORATORY IDENTIFICATION NO.: 20028

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1580	Field	RW
pH	S.U.	7.5	Field	RW
Temperature	°C	12.5	Field	RW
Depth to Water	Ft.	8.2	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.020		RW
Iron	mg/L	< 0.03		RW
Manganese	mg/L	< 0.01		RW
Sodium	mg/L	223		RW
Metals, Total				
Arsenic	mg/L	0.021		RW
Barium	mg/L	< 0.1		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	0.03		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	0.02		RW
Sodium	mg/L	298		RW
Zinc	mg/L	0.020		RW
Manganese	mg/L	< 0.01		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	29	50/86001	SS
Fluoride	mg/L	3.8	55/86001	SS
Nitrate-Nitrogen	mg/L	8.2	59/86002	SS
Sulfate	mg/L	275	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	5, 5, 6, 5	608/21	WI
Phenolics	mg/L	<0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	21,23,19,24	549/81	WI
Radiochemistry				
Gross Alpha	pCi/L	77±16	8871-21073-10	AL
Gross Beta	pCi/L	20±7	8871-21073-10	AL
Radium 226	pCi/L	0.4±0.8	8871-21073-10	AL
Pesticides				
Endrin	ug/L	*		
Lindane	ug/L	*		
Methoxychlor	ug/L	*		
Toxaphene	ug/L	*		
2, 4 - D	ug/L	< 5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	< 5.0	85-7/11	PM
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-3

LABORATORY IDENTIFICATION NO.: 20029

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1780	Field	RW
pH	S.U.	7.4	Field	RW
Temperature	°C	13.0	Field	RW
Depth to Water	Ft.	8.9	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.167		RW
Iron	mg/L	0.21		RW
Manganese	mg/L	0.42		RW
Sodium	mg/L	175		RW
Metals, Total				
Arsenic	mg/L	0.006		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	1.52		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	< 0.01		RW
Sodium	mg/L	233		RW
Zinc	mg/L	0.173		RW
Manganese	mg/L	0.42		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	23	50/86001	SS
Fluoride	mg/L	3.9	55/86001	SS
Nitrate-Nitrogen	mg/L	5.0	59/86002	SS
Sulfate	mg/L	430	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	5, 5, 4, 5	608/21	WI
Phenolics	mg/L	< 0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	20,16,15,18	549/82	WI
Radiochemistry				
Gross Alpha	pCi/L	63±15	8871-21073-10	AL
Gross Beta	pCi/L	21±7	8871-21073-10	AL
Radium 226	pCi/L	0.8±0.8	8871-21073-10	AL
Pesticides				
Endrin	ug/L	*		
Lindane	ug/L	*		
Methoxychlor	ug/L	*		
Toxaphene	ug/L	*		
2, 4 - D	ug/L	< 5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	< 5.0	85-7/11	PM
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By Sh Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-4

LABORATORY IDENTIFICATION NO.: 20030

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	3600	Field	RW
pH	S.U.	6.7	Field	RW
Temperature	°C	13.0	Field	RW
Depth to Water	Ft.	9.2	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.425		RW
Iron	mg/L	2.05		RW
Manganese	mg/L	3.9		RW
Sodium	mg/L	333		RW
Metals, Total				
Arsenic	mg/L	< 0.002		RW
Barium	mg/L	0.2		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	2.75		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	0.02		RW
Sodium	mg/L	430		RW
Zinc	mg/L	0.464		RW
Manganese	mg/L	3.9		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	140	50/86001	SS
Fluoride	mg/L	3.3	55/86001	SS
Nitrate-Nitrogen	mg/L	4.1	59/86002	SS
Sulfate	mg/L	2000	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	6, 6, 6, 6	608/21	WI
Phenolics	mg/L	<0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	33,41,35,37	549/82-83	WI
Radiochemistry				
Gross Alpha	pCi/L	100±40	8871-21073-10	AL
Gross Beta	pCi/L	63±18	8871-21073-10	AL
Radium 226	pCi/L	1.2±1.1	8871-21073-10	AL
Pesticides				
Endrin	ug/L	<0.5	85-7/11	PM
Lindane	ug/L	<0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	*		
2, 4, 5 - TP	ug/L	*		
Microbiological				
Total Coliforms	Colonies/100 ml	2		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By

SA Smith

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ANALYTICAL SERVICES

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DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
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Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-5

LABORATORY IDENTIFICATION NO.: 20031

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1250	Field	RW
pH	S.U.	7.4	Field	RW
Temperature	°C	13.5	Field	RW
Depth to Water	Ft.	9.9	Field	RW
Metals, Dissolved				
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	<0.05		RW
Lead	mg/L	<0.1		RW
Zinc	mg/L	0.013		RW
Iron	mg/L	0.21		RW
Manganese	mg/L	<0.01		RW
Sodium	mg/L	163		RW
Metals, Total				
Arsenic	mg/L	0.026		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	0.05		RW
Iron	mg/L	0.27		RW
Lead	mg/L	<0.1		RW
Mercury	mg/L	<0.0002		RW
Selenium	mg/L	<0.002		RW
Silver	mg/L	0.02		RW
Sodium	mg/L	203		RW
Zinc	mg/L	0.712		RW
Manganese	mg/L	0.04		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	37	50/86001	SS
Fluoride	mg/L	0.5	55/86001	SS
Nitrate-Nitrogen	mg/L	2.8	59/86002	SS
Sulfate	mg/L	80	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	4, 4, 4, 4	608/21	WI
Phenolics	mg/L	< 0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	15,17,17,20	549/83-84	WI
Radiochemistry				
Gross Alpha	pCi/L	52±12	8871-21073-10	AL
Gross Beta	pCi/L	14±6	8871-21073-10	AL
Radium 226	pCi/L	0.6±0.7	8871-21073-10	AL
Pesticides				
Endrin	ug/L	< 0.5	85-7/11	PM
Lindane	ug/L	< 0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	< 5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	< 5.0	85-7/11	PM
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

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AUTH.: HWS 84/3936

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FOR: Lockwood Corporation
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Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS

1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-6

LABORATORY IDENTIFICATION NO.: 20032

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1530	Field	RW
pH	S.U.	7.5	Field	RW
Temperature	°C	13.0	Field	RW
Depth to Water	Ft.	8.3	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.033		RW
Iron	mg/L	0.21		RW
Manganese	mg/L	0.34		RW
Sodium	mg/L	188		RW
Metals, Total				
Arsenic	mg/L	0.019		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	0.50		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	< 0.01		RW
Sodium	mg/L	275		RW
Zinc	mg/L	0.050		RW
Manganese	mg/L	0.34		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	27	50/86001	SS
Fluoride	mg/L	0.5	55/86001	SS
Nitrate-Nitrogen	mg/L	8.4	59/86002	SS
Sulfate	mg/L	275	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	4, 5, 4, 4	608/21-22	WI
Phenolics	mg/L	<0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	38,20,20,23	549/84	WI
Radiochemistry				
Gross Alpha	pCi/L	55±13	8871-21073-10	AL
Gross Beta	pCi/L	21±7	8871-21073-10	AL
Radium 226	pCi/L	0.4±0.8	8871-21073-10	AL
Pesticides				
Endrin	ug/L	*		
Lindane	ug/L	*		
Methoxychlor	ug/L	*		
Toxaphene	ug/L	*		
2, 4 - D	ug/L	*		
2, 4, 5 - TP	ug/L	*		
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

* Insufficient sample size.

By SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986
AUTH.: HWS 84/3936
REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS
1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-7

LABORATORY IDENTIFICATION NO.: 20033

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1460	Field	RW
pH	S.U.	7.5	Field	RW
Temperature	°C	13.0	Field	RW
Depth to Water	Ft.	9.0	Field	RW
Metals, Dissolved				
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Lead	mg/L	< 0.1		RW
Zinc	mg/L	0.044		RW
Iron	mg/L	0.13		RW
Manganese	mg/L	< 0.01		RW
Sodium	mg/L	198		RW
Metals, Total				
Arsenic	mg/L	0.023		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	< 0.005		RW
Chromium	mg/L	< 0.05		RW
Iron	mg/L	0.22		RW
Lead	mg/L	< 0.1		RW
Mercury	mg/L	< 0.0002		RW
Selenium	mg/L	< 0.002		RW
Silver	mg/L	< 0.01		RW
Sodium	mg/L	258		RW
Zinc	mg/L	0.020		RW
Manganese	mg/L	< 0.01		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	29	50/86001	SS
Fluoride	mg/L	3.7	55/86001	SS
Nitrate-Nitrogen	mg/L	5.4	59/86002	SS
Sulfate	mg/L	120	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	4, 4, 4, 5	608/22	WI
Phenolics	mg/L	<0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	32,25,22,21	549/85	WI
Radiochemistry				
Gross Alpha	pCi/L	58±14	8871-21073-10	AL
Gross Beta	pCi/L	25±7	8871-21073-10	AL
Radium 226	pCi/L	0.4±0.7	8871-21073-10	AL
Pesticides				
Endrin	ug/L	<0.5	85-7/11	PM
Lindane	ug/L	<0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	<5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	<5.0	85-7/11	PM
Microbiological				
Total Coliforms	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: March 3, 1986

AUTH.: HWS 84/3936

REPORT NO.: 85656

FOR: Lockwood Corporation
Highway 92 East
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

1 cc. Gary Brandt, HWS

1 cc. Roy Elliott, HWS

JOB NUMBER: 85/2005

DATE RECEIVED: 11-10-85

CLIENT/FIELD IDENTIFICATION: M-8

LABORATORY IDENTIFICATION NO.: 20034

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1410	Field	RW
pH	S.U.	7.7	Field	RW
Temperature	°C	13.5	Field	RW
Depth to Water	Ft.	8.9	Field	RW
Metals, Dissolved				
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	<0.05		RW
Lead	mg/L	<0.1		RW
Zinc	mg/L	0.037		RW
Iron	mg/L	<0.03		RW
Manganese	mg/L	<0.01		RW
Sodium	mg/L	195		RW
Metals, Total				
Arsenic	mg/L	0.021		RW
Barium	mg/L	0.1		RW
Cadmium	mg/L	<0.005		RW
Chromium	mg/L	<0.05		RW
Iron	mg/L	0.73		RW
Lead	mg/L	<0.1		RW
Mercury	mg/L	<0.0002		RW
Selenium	mg/L	<0.002		RW
Silver	mg/L	0.05		RW
Sodium	mg/L	230		RW
Zinc	mg/L	0.049		RW
Manganese	mg/L	0.02		RW

Analysis	Units	Concentration	Book/Page	Analyst
Inorganics, Non-Metallics				
Chloride	mg/L	19	50/86001	SS
Fluoride	mg/L	0.4	55/86001	SS
Nitrate-Nitrogen	mg/L	4.1	59/86002	SS
Sulfate	mg/L	120	54/86002	SS
Organics				
Organic Carbon, Total	mg/L	4, 4, 4, 4	608/22	WI
Phenolics	mg/L	< 0.05	69/86001	TC
Organic Halogen, Total	ug/L as Cl	21,22,24,20	549/86	WI
Radiochemistry				
Gross Alpha	pCi/L	66±15	8871-21073-10	AL
Gross Beta	pCi/L	25±7	8871-21073-10	AL
Radium 226	pCi/L	0.4±1.2	8871-21073-10	AL
Pesticides				
Endrin	ug/L	< 0.5	85-7/11	PM
Lindane	ug/L	< 0.1	85-7/11	PM
Methoxychlor	ug/L	< 25	85-7/11	PM
Toxaphene	ug/L	< 50	85-7/11	PM
2, 4 - D	ug/L	< 5.0	85-7/11	PM
2, 4, 5 - TP	ug/L	< 5.0	85-7/11	PM
Microbiological				
Total Coliform	Colonies/100 ml	< 1		RW

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EPA 600/4-81-054, EPA SW-846, and EPA 600/4-80-030, Standard Methods for the Examination of Water and Wastewater, 1985.

By

ASmith

APPENDIX C



LINCOLN OFFICE
825 J St., Box 80358
Lincoln, NE 68501
402/475-4241

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Aug. 19, 1986

NE Dept. of Environmental Control
Land Quality Division
Hazardous Wastes Section
Box 94877 State House Station
Lincoln, NE 68509-4877

ATTN: Mr. R. J. Tobin
Environmental Specialist

RE: Groundwater Monitoring
Analysis & Results
Lockwood Corporation

Dear Mr. Tobin:

Please find attached one (1) copy of the analytical laboratory results on the samples collected from the monitoring wells in April, 1986.

These results are transmitted at the request of Mr. Roy Dugan, Lockwood Corporation for your review and use.

Sincerely yours,
HWS TECHNOLOGIES INC.

By Gary C. Brandt
Gary C. Brandt

cc: Mr. R. Dugan - Lockwood Corp.

84/3936.10

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986

AUTH.: 84/3936

REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS

1 cc: Gary Brandt, HWS

RECEIVED

JOB NUMBER: 86-2005.00

AUG 21 1986

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-1

DEPARTMENT OF
ENVIRONMENTAL CONTROL

LABORATORY IDENTIFICATION NO.: 20734

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	2600	Field Determination	ES
pH	S.U.	6.9	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	3.2	15/86002	RW
Manganese	mg/L	2.1	20/86002	RW
Sodium	mg/L	147	22/86001	RW
Zinc	mg/L	0.353	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	9.16	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	1.65	6-192	AL
Sodium	mg/L	148	6-192	AL
Zinc	mg/L	0.38	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	26	50/86005	TC
Sulfate	mg/L	920	64/86012	RC

Organics

Organic Carbon, Total	mg/L	5	750-8	WL
Phenolics	mg/L	0.08	69/86002	RW
Organic Halogen, Total	ug/L as Cl	< 50	687-58	WL

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

By

Paul Mignon

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986
AUTH.: 84/3936
REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS
1 cc: Gary Brandt, HWS

RECEIVED

AUG 21 1986

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-4

LABORATORY IDENTIFICATION NO.: 20737

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	4800	Field Determination	ES
pH	S.U.	6.8	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	3.0	15/86002	RW
Manganese	mg/L	4.5	20/86002	RW
Sodium	mg/L	324	22/86001	RW
Zinc	mg/L	0.622	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	0.03	6-192	AL
Iron	mg/L	8.30	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	4.20	6-192	AL
Sodium	mg/L	320	6-192	AL
Zinc	mg/L	0.73	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	92	50/86005	TC
Sulfate	mg/L	1630	64/86012	RC

Organics

Organic Carbon, Total	mg/L	5	750-8	WL
Phenolics	mg/L	0.06	69/86002	RW
Organic Halogen, Total	ug/L as Cl	< 100	687-59	WL

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

By

Paul McGinnis

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986

AUTH.: 84/3936

REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS

~~1~~ cc: Gary Brandt, HWS

RECEIVED

AUG 21 1986

JOB NUMBER: 86-2005.00

DEPARTMENT OF
ENVIRONMENTAL CONTROL

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-5

LABORATORY IDENTIFICATION NO.: 20738

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	mg/L as CaCO ₃	900	Field Determination	ES
pH	S.U.	7.4	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	< 0.05	15/86002	RW
Manganese	mg/L	0.02	20/86002	RW
Sodium	mg/L	173	22/86001	RW
Zinc	mg/L	0.020	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	0.08	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	0.10	6-192	AL
Sodium	mg/L	172	6-192	AL
Zinc	mg/L	0.04	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	32	50/86005	TC
Sulfate	mg/L	150	64/86012	RC

Organics

Organic Carbon, Total

mg/L

3

750-8

WL

Phenolics

mg/L

0.13

69/86002

RW

Organic Halogen, Total

ug/L as Cl

≤ 100

687-59

WL

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

By

Paul Mignon

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986

AUTH.: 84/3936

REPORT NO.: 86767

File Phase 1

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS

~~1~~ cc: Gary Brandt, HWS

RECEIVED

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

AUG 21 1986

CLIENT/FIELD IDENTIFICATION: M-8

DEPARTMENT OF
ENVIRONMENTAL CONTROL

LABORATORY IDENTIFICATION NO.: 20741

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1100	Field Determination	ES
pH	S.U.	7.5	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	< 0.05	15/86002	RW
Manganese	mg/L	< 0.01	20/86002	RW
Sodium	mg/L	209	22/86001	RW
Zinc	mg/L	0.020	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	0.01	6-192	AL
Iron	mg/L	0.16	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	0.02	6-192	AL
Sodium	mg/L	207	6-192	AL
Zinc	mg/L	0.05	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	27	50/86005	TC
Sulfate	mg/L	320	64/86012	RC

Organics

Organic Carbon, Total	mg/L	4	750-8	WL
Phenolics	mg/L	< 0.05	69/86002	RW
Organic Halogen, Total	ug/L as Cl	< 50	687-59	WL

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

By

Paul Mignos

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986
AUTH.: 84/3936
REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS
✓ cc: Gary Brandt, HWS

RECEIVED

AUG 21 1986

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-3

LABORATORY IDENTIFICATION NO.: 20736

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1500	Field Determination	ES
pH	S.U.	7.3	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	0.69	15/86002	RW
Manganese	mg/L	0.35	20/86002	RW
Sodium	mg/L	178	22/86001	RW
Zinc	mg/L	0.159	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	4.28	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	0.34	6-192	AL
Sodium	mg/L	178	6-192	AL
Zinc	mg/L	0.27	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	27	50/86005	TC
Sulfate	mg/L	540	64/86012	RC

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

By

Paul Mignon

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986
AUTH.: 84/3936
REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS
1 cc: Gary Brandt, HWS

RECEIVED

AUG 21 1986

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-2

LABORATORY IDENTIFICATION NO.: 20735

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1500	Field Determination	ES
pH	S.U.	7.3	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	< 0.05	15/86002	RW
Manganese	mg/L	< 0.01	20/86002	RW
Sodium	mg/L	220	22/86001	RW
Zinc	mg/L	0.033	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	0.35	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	2.98	6-192	AL
Sodium	mg/L	229	6-192	AL
Zinc	mg/L	0.20	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	31	50/86005	TC
Sulfate	mg/L	406	64/86012	RC

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

By

Paul Mignon

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986
AUTH.: 84/3936
REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS
✓ cc: Gary Brandt, HWS

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-7

LABORATORY IDENTIFICATION NO.: 20740

RECEIVED

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1300	Field Determination	ES
pH	S.U.	7.4	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	< 0.005	10/86006	RW
Chromium	mg/L	< 0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	< 0.05	15/86002	RW
Manganese	mg/L	< 0.01	20/86002	RW
Sodium	mg/L	218	22/86001	RW
Zinc	mg/L	0.026	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	0.14	6-192	AL
Lead	mg/L	< 0.025	6-192	AL
Manganese	mg/L	0.01	6-192	AL
Sodium	mg/L	217	6-192	AL
Zinc	mg/L	0.04	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	30	50/86005	TC
Sulfate	mg/L	306	64/86012	RC

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

By

Paul Mignon

HWS TECHNOLOGIES INC.
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: August 6, 1986
AUTH.: 84/3936
REPORT NO.: 86767

FOR: Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Attn: Mr. Roy Dugan

1 cc: Roy Elliott, HWS
1 cc: Gary Brandt, HWS

RECEIVED

JOB NUMBER: 86-2005.00

DATE RECEIVED: 4-11-86

CLIENT/FIELD IDENTIFICATION: M-6

LABORATORY IDENTIFICATION NO.: 20739

AUG 21 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
Specific Conductance	umhos/cm	1300	Field Determination	ES
pH	S.U.	7.5	Field Determination	ES
Metals, Dissolved				
Cadmium	mg/L	<0.005	10/86006	RW
Chromium	mg/L	<0.05	12/86002	RW
Lead	mg/L	< 0.1	24/86001	RW
Iron	mg/L	<0.05	15/86002	RW
Manganese	mg/L	0.15	20/86002	RW
Sodium	mg/L	216	22/86001	RW
Zinc	mg/L	0.056	32/86003	RW
Metals, Total				
Cadmium	mg/L	< 0.005	6-192	AL
Chromium	mg/L	< 0.01	6-192	AL
Iron	mg/L	0.70	6-192	AL
Lead	mg/L	0.03	6-192	AL
Manganese	mg/L	0.13	6-192	AL
Sodium	mg/L	220	6-192	AL
Zinc	mg/L	0.05	6-192	AL
Inorganics, Non-Metallics				
Chloride	mg/L	27	50/86005	TC
Sulfate	mg/L	332	64/86012	RC

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes.

By

Paul Mignor

APPENDIX D

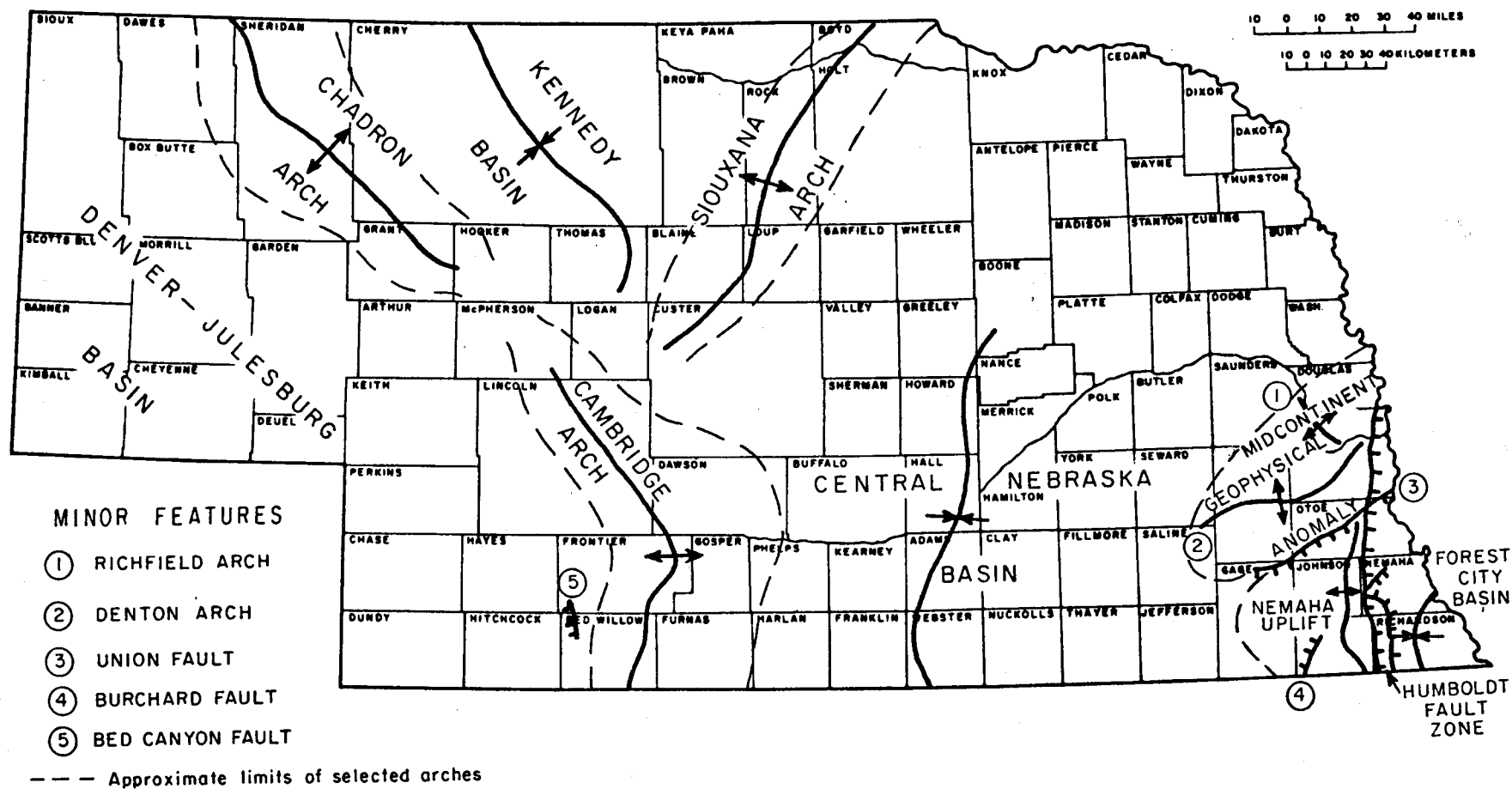
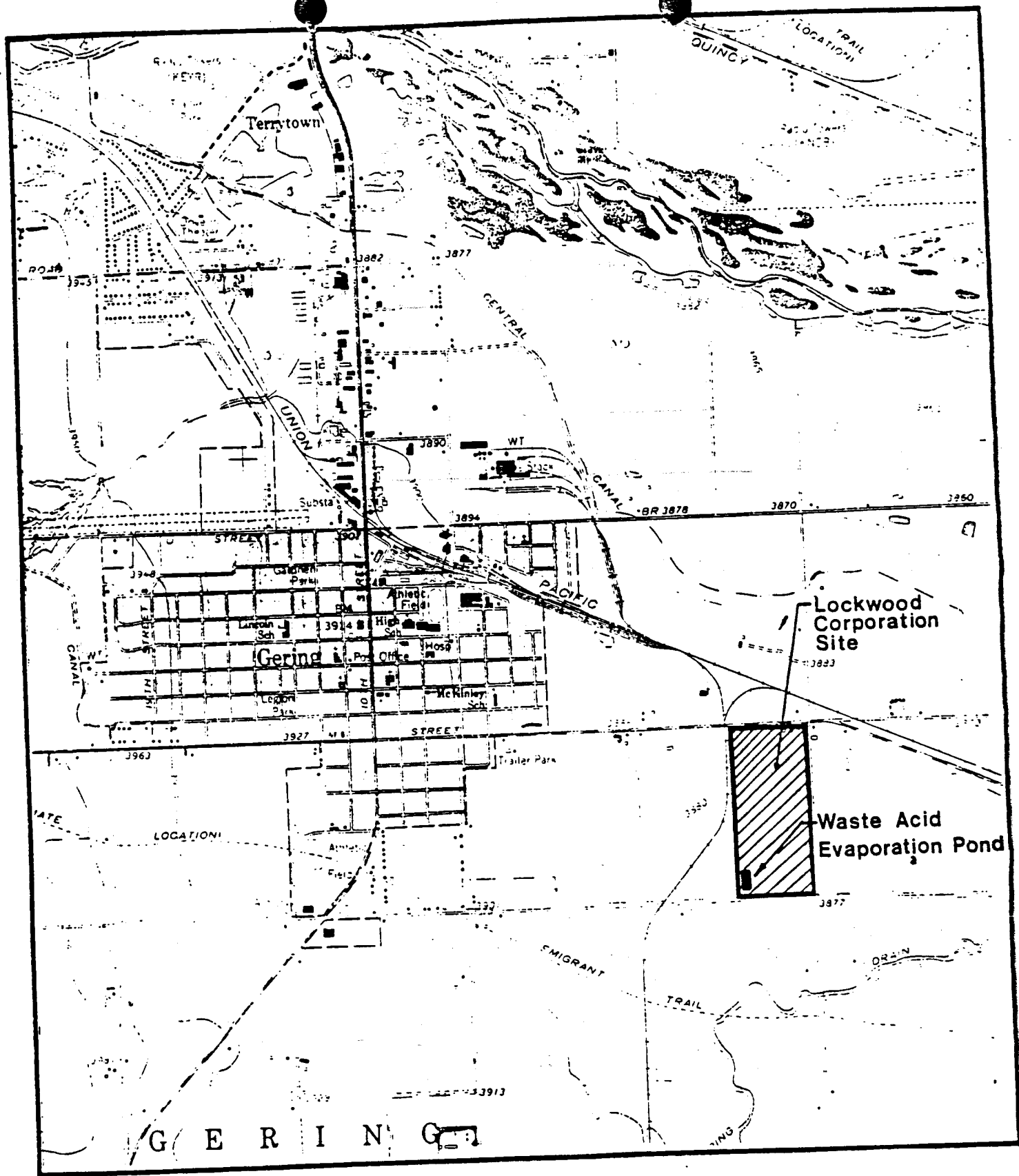


Fig. 1. Principal structural features of Nebraska.

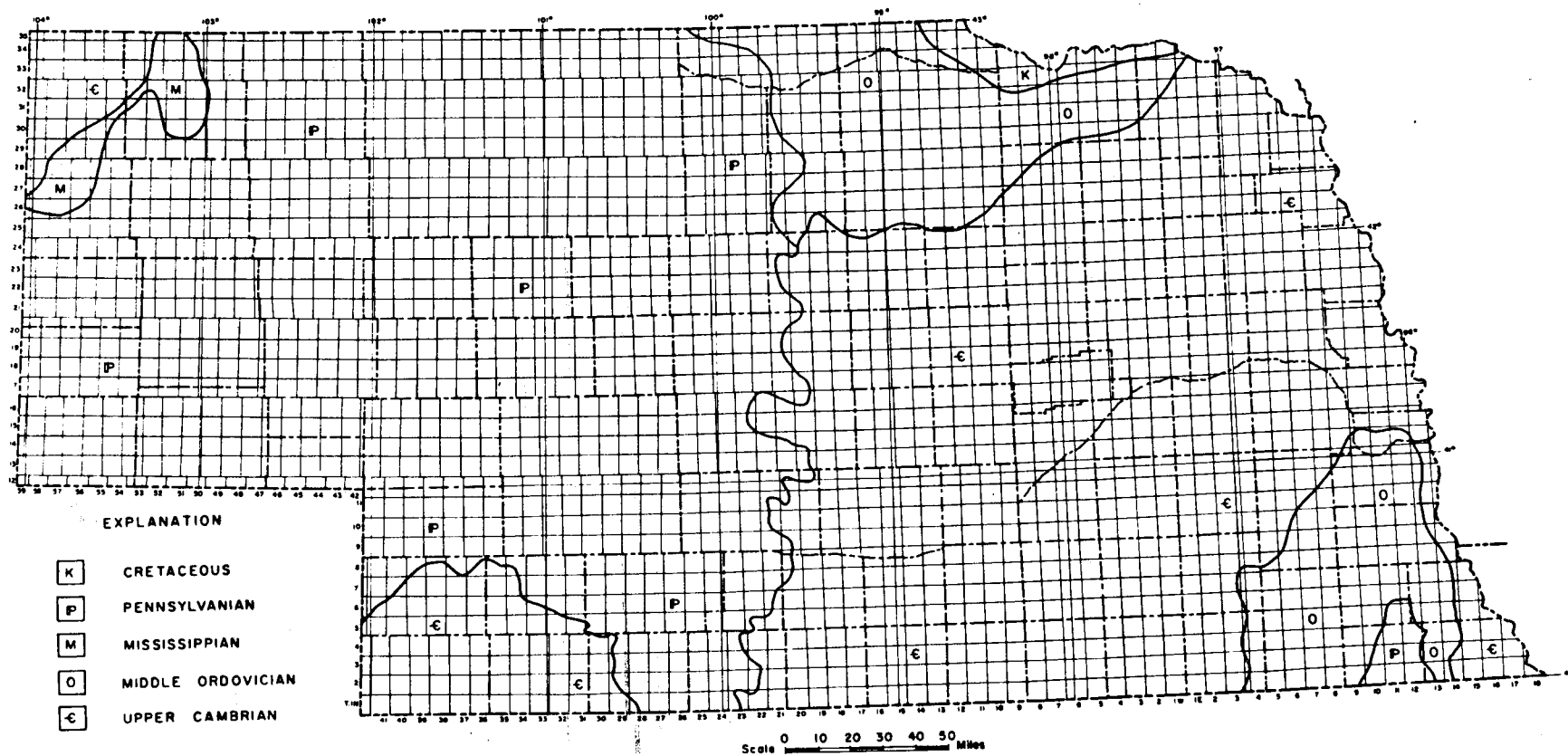


LOCKWOOD CORPORATION

WASTE ACID EVAPORATION POND LOCATION MAP

SCALE: 1" = 2000'

Figure 2



SUPRAGEOLOGIC MAP OF THE PRECAMBRIAN SURFACE
 MARVIN P. CARLSON
 1969

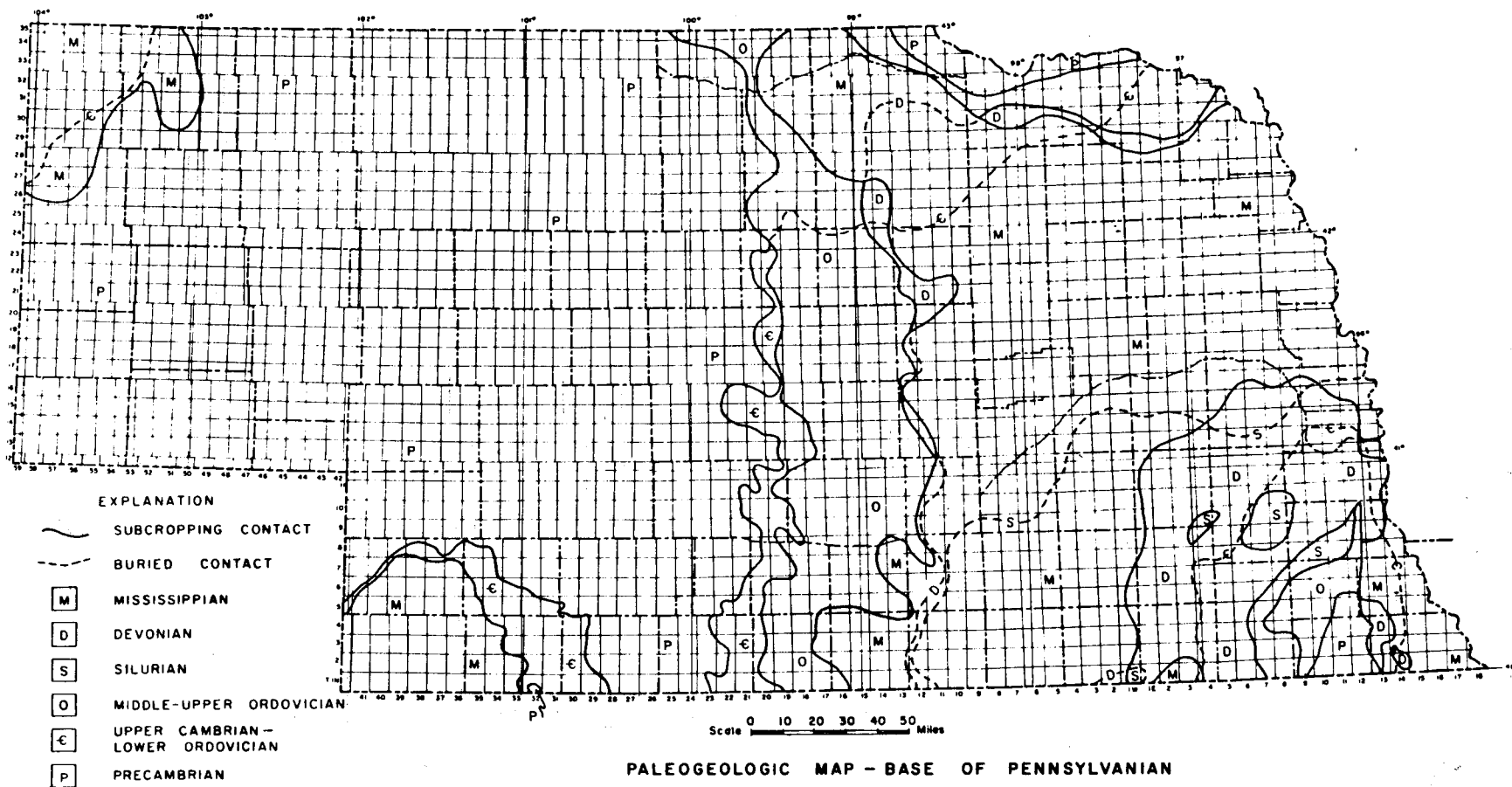


Figure 4



Harris Laboratories, Inc.

→ P.O. BOX 80837 • 624 PEACH STREET, LINCOLN, NEBRASKA 68501 • TELEPHONE 402/476-2811

Report of Analysis

For Lockwood Corporation
P.O. Box 160
Gering, NE 69341

Date February 12, 1981

Laboratory No. 28729

Sample of
Water & Sludge

Received February 9, 1981

Sample Marked
Dry Sludge, Wet Sludge, Pond Water _____

A. Sludge Samples

Lead (Pb)

Arsenic (As)

Sample 1 (Dry)

4.7%

200 ppm

Sample 2 (Wet)

6.4%

183 ppm

B. Water Sample

Lead (Pb) - 9.0 ppm

Magnesium (Mg) 22.0 ppm

Copper (Cu) - 1.2 ppm

Arsenic (As) 9.2 ppm

Cadmium (Cd) - 1.1 ppm

Molybdenum (Mo) 3.1 ppm

Manganese (Mn) - 85.0 ppm

Chromium (Cr) 7.2 ppm

Nickel (Ni) - 4.7 ppm

Selenium (Se) 11.2 ppm

Aluminum (Al) - 8.5 ppm

ppm = Parts Per Million

Method: ICP-AE Method 200.7, USEPA



SAMPLES ARE DISCARDED IN 15 DAYS FROM DATE OF REPORT UNLESS WE ARE REQUESTED, IN WRITING, TO RETAIN THEM FOR A LONGER PERIOD. PERISHABLE SAMPLES ARE USUALLY DISCARDED IMMEDIATELY UNLESS CLIENT HAS REQUESTED SPECIAL HANDLING (FREEZING, ETC.) IN ADVANCE.

Respectfully submitted,
HARRIS LABORATORIES, Inc.

By

Brad Rutledge

HAZARDOUS WASTE INFORMATION SHEET

1. Complete legal name and address of facility:

Telephone Number 308/436-6335LOCKWOOD CORPPO Box 160Gering, NEBR 69341

2. Correct name, address and title of responsible person (must be owner, partner, mayor, resident agent, chairman of the board or designated representative):

Roy Dugan - Gen Foreman436-6331NORMAN WALTON VP of Manufacturing

3. Does the facility have an EPA Identification Number?

Yes ☒ No ☐If yes, list number NED 0441014424. Is facility a ☐ Non-notifier; ☒ Notifier5. They notified as ☐ Gen; ☐ Trans; ☐ Treat; ☐ Store; ☐ Disp; ☐ SMQ; ☒ NH

6. Do they have a copy of their Hazardous Waste Permit?

Yes ☐ No ☐

WASTE DESCRIPTION

7. Process description: Center pivot Irrigation systems manufacturingHot Dip Galvanizing - painting, elementary neutralization

8. Hazardous Waste (if additional space needed go to page 3)

Name and Address
of Disposition

Material & No.

Quantity

Transporter & Name

Total quantity (lbs or kg) _____

What is the basis for these hazardous waste determinations? _____

COMMENTS: ① paint wash $Fe(PO_4)$ 2%/wt Chlorochemical
dumped \approx 16 wk intervals to WWTP

② Maching shop w/ enclosed oil system

③ Solvents to Safety-Kleen Corp.

④ Pickle liquors to plastic lined pit following
neutralization (see attached analysis of sludge & H_2O)

⑤ Ev drippings swept, stored in barrels and
recycled

⑥ paint wash system sludges disposed of on premises
sometimes to Hering SLF

⑦ paints used SUR COAT 903, COR AD
927 & Super Fast DRI-ENAMEL another paint
DOT F75 NT2 1882-A had not other labels.

See some problems with paint wash system
sludge disposal; also lagoon system DEC approval
supposedly given.

Inspector's Name:

Rene Decha / Ken Hassler

Date:

Aug 1982

Reviewer's Name:

Date:

18. Do they use and maintain a manifest?

Yes ☐ No ☐

19. Are completed copies retained for 3 years?

Yes ☐ No ☐

20. Does owner/operator maintain a written inspection log of waste holding area.
(name, date, time, observations, remedial action)?

Yes ☐ No ☐

Comments: _____

21. Do they have a copy of the State Emergency Response Plan?

Yes ☐ No ☐

22. Does the facility have the following reports?

Annual Report Yes ☐ No ☐

Exception Report Yes ☐ No ☐ ; Dates _____ ; _____ ; _____

Analysis Results Yes ☐ No ☐

23. Other Non-Hazardous Solid Wastes

Place of Disposition

General Refuse

Gerling SLF

Determination:

☐ Facility notified properly

☐ Facility needs to notify

☐ Facility is a Non-Handler, remove from system

☐ Inaccurate notification,
Facility should have notified
as:

☐ Generator

☐ TSD

☐ Transporter

☐ SMQ

HAZARDOUS WASTE INFORMATION SHEET

Facility

1. Complete legal name and address of facility: Lockwood Corporation
Telephone Number (308) 436-6327 P.O. Box 160
Gering Ne
2. Correct name, address and title of responsible person (must be owner, partner, mayor, resident agent, chairman of the board or designated representative):
Ray Dugan
General Foreman
3. Does the facility have an EPA Identification Number? Yes ☒ No ☐
If yes, list number NE044 101 442
4. Is facility a ☐ Non-notifier; ☒ Notifier
5. They notified as ☐ Gen; ☐ Trans; ☒ Treat; ☒ Store; ☒ Disp; ☐ SMQ; ☐ NH
6. Do they have a copy of their Hazardous Waste Permit? Yes ☐ No ☐

WASTE DESCRIPTION

7. Process description: Manufacturing

- | Hazardous Waste Material & No. | (if additional space needed go to page 3) | Quantity | Transporter & Name | Name and Address of Disposition |
|--------------------------------|---|---------------|--------------------|------------------------------------|
| D002 | | (300,240 lbs) | | |
| Caustic/Acid | | 36000 Gal mo | | Neutralized to Surface Impoundment |
| Paint Sludges | | 2000 lbs mo | Local hauler | Gering Landfill |
| Paint Filters | | 600 lbs mo | Local hauler | Gering Landfill |

Total quantity (lbs or kg) 302,840 lbs mo

What is the basis for these hazardous waste determinations?

9. Do they qualify as a Small Quantity Generator?

Yes ☐ No ☒

STORAGE

10. Are the containers in good condition (leaking, corroding)? No

open top barrels

11. Do they have an adequate storage area for their hazardous wastes?

Yes ☐ No ☒

12. Is security adequate?

Yes ☒ No ☐

13. Is each container properly marked and dated?

Yes ☐ No ☒

14. Container accumulation time: Not known

Requirements for Ignitable, Reactive or Incompatible Waste

15. Does facility handle ignitable or reactive wastes?

Yes ☒ No ☐

A. If yes, is waste separated and confined from sources of ignition or reaction, (open flames, smoking, cutting and welding, hot surfaces, frictional heat) sparks (static, electrical or mechanical), spontaneous ignition (e.g. from heat producing chemical reactions) and radiant heat? Yes ☒ No ☐

B. Are smoking and open flame confined to specifically designated locations? Yes ☐ No ☒

C. Are "No Smoking" signs posted in hazardous areas? Yes ☐ No ☒

16. Are containers containing ignitable or reactive wastes stored at least 50' from property line? Yes ☒ No ☐

RECORDS

General Inspection Requirements

17. Does the owner/operator maintain a written schedule at the facility for inspecting:

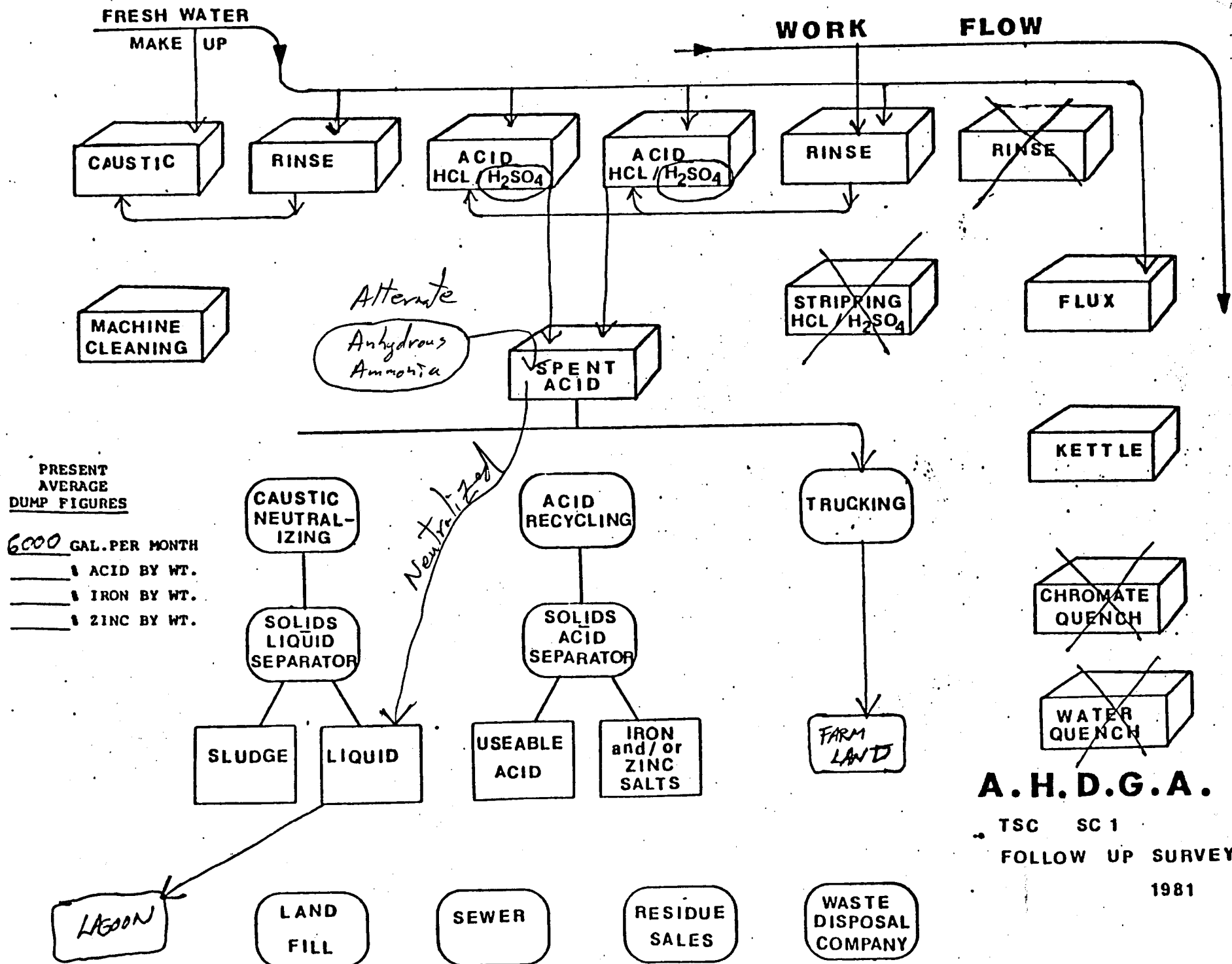
A. Monitoring equipment? - - - - - Yes ☒ No ☐

B. Safety and emergency equipment? Yes ☒ No ☐

C. Security devices? - - - - - Yes ☒ No ☐

D. Operating and structural equipment? Yes ☒ No ☐

*inspected or
operated daily
No record kept*

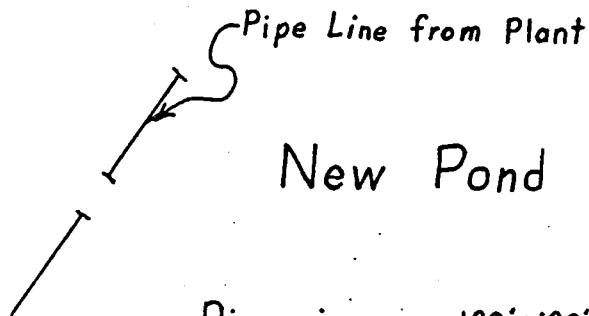


A.H.D.G.A.

TSC SC 1

FOLLOW UP SURVEY

1981



Dimension — 120'x120'x5'
Side Slope — 3:1 ss
Volume — 1.24 ac.ft.
Capacity — 403,889 gallons

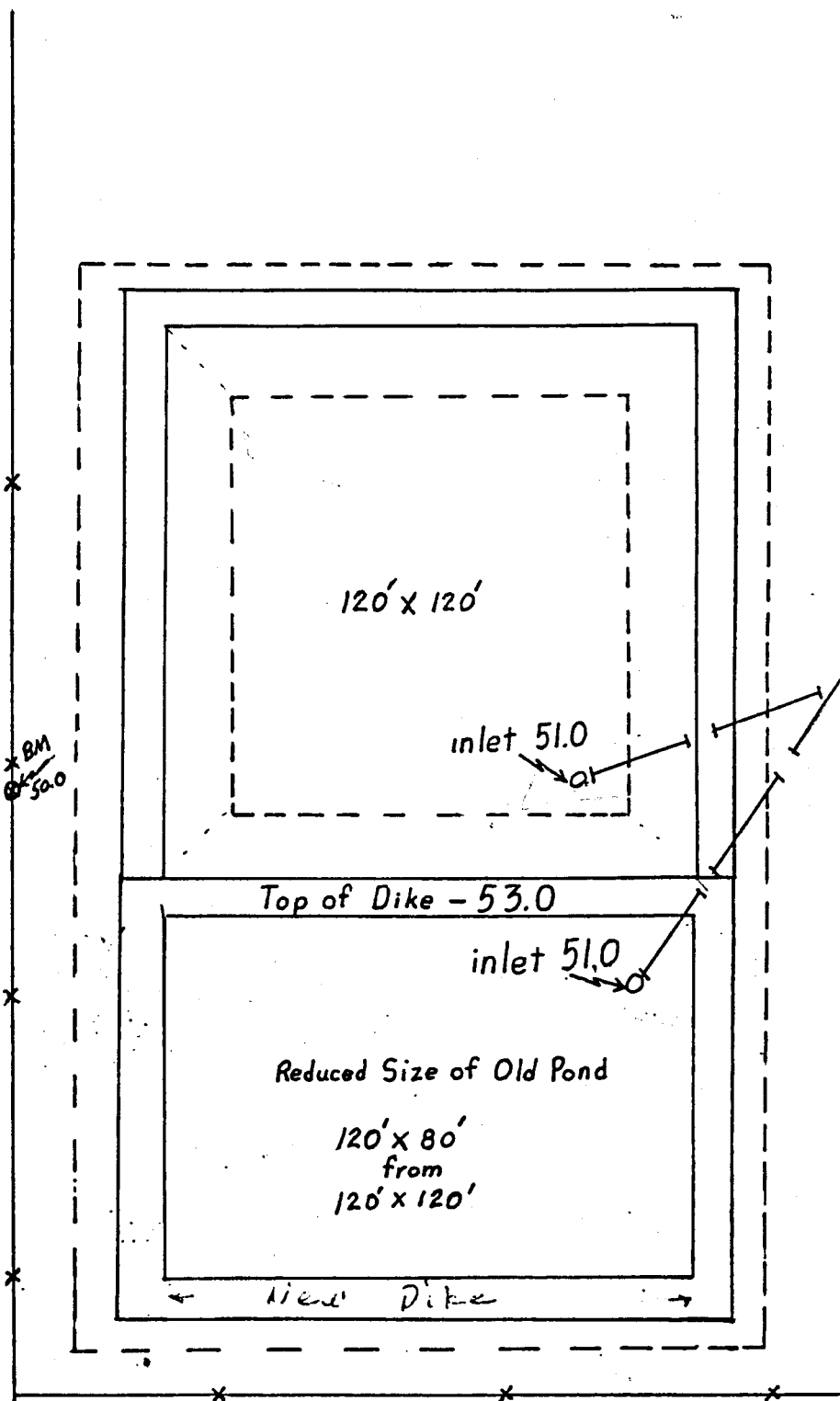
Construction

Bottom — 2' below average ground
Top — 3' above average ground
Bentonite @ 1lb. per sq. ft.

SANITATION DETAILS	
APPROVED	
STATE OF NEBRASKA	
Dept. of Environmental Control	
JAN 13 1978	<i>W. H. Lee</i>

Lockwood Corp.	
Evaporation Pond	
208-635-2513	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed <i>G.F. Matlock</i> 12/15/77	Date 12/15/77
Drawn <i>G.F. Matlock</i> 12/15/77	Approved by _____
Traced <i>M.L.H. Thompson</i> 12/15/77	Title _____
Checked _____	Sheet No. 1 of 1
	Drawing No. _____

Gering, Nebraska



Scale - 1" = 40'

COMMENTS:

plating operation - all tanks are drained into a concrete tank out side of main building called a neutralizing tank - Anhydrous Ammonia is added to this tank to neutralize waste. Waste then pumped to surface impoundment. normal operation will dump 1 tank per wk or 9000 gal. of 10% sulfuric acid.

Paint sludges are generated at rate of 1 barrel per wk - paint filters are also containerized, barrels filled with water - all paint waste go to Slurry landfill.

1. E.p. toxic analysis needed on

(a) Sludges in neutralization tank

(b) Sludges in lagoon

(c) paint sludges

(d) liquid in neutralization tank.

(E) Containerized sludges on hand.

Inspector's Name:

Hansell W. Fast

Date:

3/7/84

Reviewer's Name:

Date:

13. Do they use and maintain a manifest?

Yes ☐ No ☒

14. Are completed copies retained for 3 years?

NA Yes ☐ No ☐

10. Does owner/operator maintain a written inspection log of waste holding area.
(name, date, time, observations, remedial action)?

Yes ☐ No ☒

Comments: _____

21. Do they have a copy of the State Emergency Response Plan?

Yes ☐ No ☒

22. Does the facility have the following reports?

Annual Report Yes ☒ No ☐

Exception Report Yes ☐ No ☐ ; Dates _____ ; _____ ; _____

Analysis Results Yes ☐ No ☐

23. Other Non-Hazardous Solid Wastes

Place of Disposition

Determination:

☐ Facility notified properly

☐ Facility needs to notify

☐ Facility is a Non-Handler, remove from system

☒ Inaccurate notification.
Facility should have notified
as:

☒ Generator

☐ Transporter

☒ TSD

☐ SMQ



3/7/84

Lockwood
Lagoon

Looking west



3/7/84

Lockwood
Lagoon

Looking south



3/7/84

Lockwood
Lagoon

Looking
South west

Approval

Coordination

Div Ch	CH Plans	CH	CH P/E
Deputy	HD Prog/P1	HD	HD WM
Drafter <i>DP</i>	Data Proc.	HD S/W	HD P/L
Fiscal	Grants	Air	<i>M.S.</i>
Legal	Engr	Ag	FILE

March 15, 1984

Mr. Roy Dugan
Lockwood Corporation
P.O. Box 160
Gering, NE 69341

Dear Mr. Dugan:

As explained to Bob Knoles during a phone conversation on March 15, 1984, a decision as to the status of Lockwood in the RCRA program cannot be established until we have received the following requested E.P. toxicity analysis. At that time I requested E.P. analysis on waste taken from the following locations.

1. One of the (open top) barrels, adjacent to the neutralizer tank.
2. The sludge from the bottom of the neutralizer tank.
3. The liquid in the neutralizer tank.
4. The sludge in the surface impoundment bottom.
5. Paint sludge.

Our records indicate that in correspondence dated March 11, 1981, with the EPA regional office in Kansas City you were notified that you are a non-handler of hazardous waste.

The notification of hazardous waste activity in our records, dated May 23, 1983, indicates that you are a treater, storer, disposer of hazardous waste.

When we have received the information which we have requested, a decision can then be made as to what the status of your facility may be.

Should it be concluded that your facility is in fact a treater, storer, disposer of hazardous waste, there are other minor violations which will have to be addressed; however, you will be advised of such need should it be necessary.

Please submit the requested analysis within 30 days.

Should you have questions call me at (402) 471-4217.

Sincerely,

Donald W. Post
Environmental Specialist
Hazardous Waste Management Section

krs

cc: Bob Knoles

cc: Mike Sanderson, U.S. EPA, Region VII, w/tracking sheet

Memorandum

To: Bill Imig

From: Jon Atkinson

Through: Clark Haberman

Date: April 3, 1984

Subject: Hydrogeologic conditions in vicinity of Lockwood Corp. lagoon system
(21-55-1d)

Direction of regional ground-water flow is east-northeast toward the Platte River. Based on available maps, depth to the water table is approximately 10 feet. Distance from the lagoon floor to the water table most likely is less than 10 feet.

Soils at the site are classified as Mitchell silt loam. Permeability ranges from 0.8 to 2.5 inches per hour and is rated by the SCS as moderate.

According to a NRC computer printout, a registered municipal-supply well is located in NW $\frac{1}{4}$ SE $\frac{1}{4}$ of section 1. This well is reported to be 338 feet deep with a static water level of 16 feet. My estimate is that the distance between this well and the lagoon system is 2,000 feet or less. Given the high pumping rate (1200 gpm) of this municipal-supply well, its zone of influence possibly extends to the lagoon. The 7.5 minute topographic map shows several houses within one-half mile that probably utilize private wells.

JA/ds

pc: Beth Rowan

CONVERSATION RECORD OR OFFICE MEMORANDUM

Subject Analysis of Lagoon Wastewater - Lockwood Corporation	Date 5-6-84
Agency Representative Mike Steffensmeier	
Person Contacted Roy Dugan, Lockwood Corporation	Phone Number 308/436-5051

Summary of Conversation

Mr. Dugan reported results of analysis of neutralized acid in the lagoon.

pH	2.9
Cd	65 ppm (E. P. Toxicity)
Cr	42.1 ppm (E. P. Toxicity)
Pb	4.2 ppm (E. P. Toxicity)

This shows lagoon has been receiving hazardous waste. Copy of analysis report will be sent.

MS/th



LOCKWOOD CORPORATION
P.O. Box 160 • Gering, Nebraska 69341 (308) 436-5051 • Telex 484454

DP.
MS-

April 13, 1984

RECEIVED

APR 17 1984

State Of Nebraska
Department Of Environmental Control
Box 94877
Lincoln, NE 68509-4877

DEPARTMENT OF
ENVIRONMENTAL CONTROL

ATTENTION: MIKE STEFFENSMEIER

Dear Mr. Steffensmeier:

Per the March 15, 1984 request from Donald Post (your office), we are sending this letter along with the current laboratory analysis received from A & L Midwest Labs.

Lab No. 2774-1 Acid Tank Sulphuric Acid Solution: This process tank was sampled to check the pH of our in-process pickle tank solution. pH = 0.1

Lab No. 2774-2 Caustic Tank Sodium Hydroxide Solution: This process tank was sampled to check the pH of our in-process strip tank solution. pH = 12.6

Lab No. 2774-3 Evaporation Pit Sludge: The EP toxicity tests show nontoxic levels.

Lab No. 2774-4 Neutralization Pit Sludge: The EP toxicity tests show nontoxic levels.

Lab No. 2774-5 Paint Sludge: The EP ignitability test shows not ignitable. The EP toxicity tests show nontoxic levels.

Lab No. 2835 Evaporation Pit Liquid Resample: A sample of the non-evaporated surface liquid was drawn for a test, and the sample showed pH corrosivity of 0.5 and high levels of Cadmium and Chromium.

These tests of waste acid solution will be repeated to determine if the sample was representative of the normal solution. We believe the neutralization process was improper or the sample was concentrated by the evaporation pit procedure.

Our normal neutralization process of adding Anhydrous Ammonia to the waste acid solution to raise the pH above 2.0 should be adequate to provide a non-corrosive waste with nontoxic metallic levels. We are monitoring the neutralization process to prevent any further problems, and may modify the neutralization process to include the

addition of soda ash to bring the pH over 2.4.

Since the sludge samples from both the neutralization pit and the evaporation pit show the Cadmium and Chromium levels are below toxic limits, the normal waste solution levels should also be below toxic limits. Samples will be drawn from the next discharge of waste acid.

There are two lab analysis reports still pending from A & L.

1. The sludge sample of acid tank cleanout sludge from the storage drum.
2. The sludge sample from the preflux tank from storage drum.

These reports should be available this week, and the results will be forwarded to you as soon as possible.

Please contact me if you have further questions or comments.

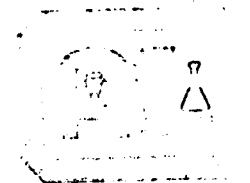
Cordially,


ROY R. DUGAN
GENERAL FOREMAN

RRD/rb

cc R. Knoles
N. Walton

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-634-7772



REPORT NUMBER 4-086-712

March 26, 1984

Enviro Services #8537
Box 118, Route #2
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

Date received:

3-13-84

<u>Lab No.</u>	<u>Sample Ident.</u>	<u>Analysis</u>	<u>Level</u>	<u>Sensitivity</u>	<u>Method</u>
2774-1	Acid Tank	pH	0.1		Electrode
		Corrosivity	Considered Corrosive		EPA
2774-2	Caustic Tank	pH	12.6		Electrode
		Crossovity	Considered Corrosive		EPA

Comments:

Respectfully submitted,

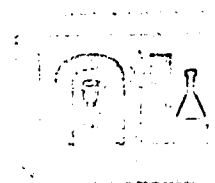
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Tracy Coats

Tracy Coats, Environmental Services

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A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-086-713

March 26, 1984

Enviro Services #8537
Route #2, Box 118
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

Date received:

3-13-84

<u>Lab No.</u>	<u>Sample Ident.</u>	<u>Analysis</u>	<u>Level</u>	<u>Sensitivity</u>	<u>Method</u>
2774-3	Evaporation Pit Sludge	EP Toxicity:			
		Hexavalent Chromium	Less than .007 ppm	0.007 ppm	Flame AA
		Zinc	520 ppm	0.01 ppm	Flame AA
		Arsenic	0.016 ppm	0.005 ppm	Hydride
		Mercury	Less than .010 ppm	0.010 ppm	Cold Vapor
		Selenium	Less than .005 ppm	0.005 ppm	Hydride
		Lead	1.4 ppm	0.2 ppm	Flame AA
		Cadmium	0.33 ppm	0.01 ppm	Flame AA
		Chromium	0.4 ppm	0.1 ppm	Flame AA
		Barium	Less than 0.3 ppm	0.3 ppm	Flame AA
		Silver	Less than .04 ppm	0.04 ppm	Flame AA

Comments:

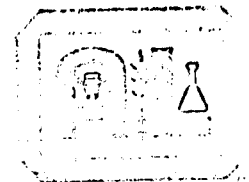
Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-086-714

March 26, 1984

Enviro Service #8537
Route #2, Box 118
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

3-13-84

Date received:

<u>Lab No.</u>	<u>Sample Ident.</u>	<u>Analysis</u>	<u>Level</u>	<u>Sensitivity</u>	<u>Method</u>
2774-4	Neutralization Pit	EP Toxicity:			
		Hexavalent Chromium	Less than .007 ppm	0.007 ppm	Flame AA
		Zinc	2800 ppm	0.01 ppm	Flame AA
		Arsenic	0.068 ppm	0.005 ppm	Hydride
		Mercury	Less than .010 ppm	0.010 ppm	Cold Vapor
		Selenium	Less than .005 ppm	0.005 ppm	Hydride
		Lead	3.0 ppm	0.2 ppm	Flame AA
		Cadmium	0.70 ppm	0.1 ppm	Flame AA
		Chromium	0.5 ppm	0.1 ppm	Flame AA
		Barium	Less than 0.3 ppm	0.3 ppm	Flame AA
		Silver	Less than .04 ppm	0.04 ppm	Flame AA

Comments:

Respectfully submitted,

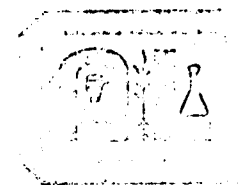
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13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-090-726

March 30, 1984

Enviro Services #8537
Pete Brixius
Route #2, Box 118
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

Date received:

3-13-84

<u>Lab No.</u>	<u>Sample Ident.</u>	<u>Analysis</u>	<u>Level</u>	<u>Sensitivity</u>	<u>Method</u>
2774-5	Paint Sludge	EP Ignitability	Not ignitable		
		EP Toxicity:			
		Arsenic	Less than .005 ppm	0.005 ppm	Hydride
		Selenium	Less than .005 ppm	0.005 ppm	Hydride
		Mercury	Less than .010 ppm	0.010 ppm	Cold Vapor
		Lead	0.7 ppm	Less than .2 ppm	Flame AA
		Cadmium	Less than .01 ppm	0.01 ppm	Flame AA
		Chromium	Less than 0.1 ppm	0.1 ppm	Flame AA
		Barium	Less than 0.3 ppm	0.3 ppm	Flame AA
		Silver	Less than .03 ppm	0.03 ppm	Flame AA

Comments:

Respectfully submitted,

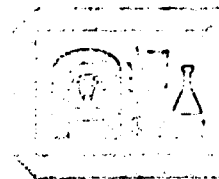
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13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-090-727

March 30, 1984

Enviro Service, Inc. #8537
Pete Brixius
Route #2, Box 118
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

Date received:

3-16-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
2835	Evaporation and Liquid Resample	EP Toxicity: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Hexavalent Chromium Zinc pH-Corrosivity	Less than .005 ppm Less than 0.3 ppm 56 ppm 42 ppm 1.9 ppm Less than .010 ppm Less than .005 ppm Less than .03 ppm Less than .007 ppm 5.1% 0.5 Considered corrosive	0.005 ppm 0.3 ppm 0.01 ppm 0.1 ppm 0.2 ppm 0.010 ppm 0.005 ppm 0.03 ppm 0.007 ppm 	Hydride Flame AA Flame AA Flame AA Flame AA Cold Vapor Hydride Flame AA Flame AA (MIBK) Electrode EPA 5.0

Comments:

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

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as, the results of our company in any advertising, news release, or other public announcements without obtaining our permission.



LOCKWOOD CORPORATION
P.O. Box 160 • Gering, Nebraska 69341 (308) 436-5051 • Telex 484454

MS
RECEIVED

MAY 14 1984

**DEPARTMENT OF
ENVIRONMENTAL CONTROL**

May 8, 1984

State Of Nebraska
Department Of Environmental Control
Box 94877
Lincoln, NE 68509-4877

ATTENTION: MIKE STEFFENSMEIER

Dear Mr. Steffensmeier:

Per our phone conversation this date, I am sending the attached lab analysis sheets which I indicated were still pending in my letter of April 13, 1984.

Lab No. 3013-1 Preflux Tank Sludge: This sludge is cleanout from the zinc chloride solution tank. EP toxicity analysis shows nontoxic levels.

Lab No. 3013-2 Acid Tank Sludge: This sludge is cleanout from sulphuric acid solution tank stored in covered 55-gallon drums for disposal. EP toxicity analysis shows nontoxic levels.

We have sent one additional sample of neutralized sulphuric acid waste liquid for analysis and will forward the results when they are received.

Your crew took three samples on April 18, and we are also awaiting your test results.

Cordially,

Roy R. Dugan
ROY R. DUGAN
GENERAL FOREMAN

RRD/rb

cc B. Knoles
 N. Walton

Enclosure

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-123-715

May 2, 1984

SUBJECT: Environmental Analysis - EP Toxicity

Enviro Services #8537
Pete Brixius
R 2, Box 118
Scottsbluff, NE 69361

Date sampled:
Date received: 3-28-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
3013-1	Preflux Sludge	Hexavalent Chromium	Less than 10 ug/l		Standard Method 312B
		Zinc (%)	.10%	.01 ppm	Flame AA
		Arsenic	Less than .005 ppm	.005 ppm	Hydride
		Barium	0.4 ppm	0.4 ppm	Flame AA
		Cadmium	.20 ppm	.01 ppm	Flame AA
		Chromium	Less than .10 ppm	.10 ppm	Flame AA
		Lead	0.5 ppm	0.1 ppm	Flame AA
		Mercury	Less than .001 ppm	.001 ppm	Cold Vapor
		Selenium	Less than .002 ppm	.002 ppm	Hydride
		Silver	Less than .04 ppm	.04 ppm	Flame AA

m p h ?
WR

Comments: *EP TOXICITY ANALYSIS*

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
 13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-123-716

May 2, 1984

Enviro Services #8537
 Pete Brixius
 R 2, Box 118
 Scottsbluff, NE 69361

SUBJECT: Environmental Analysis - EP Toxicity

Date sampled:
 Date received: 3-28-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
3013-2	Acid Sludge	Zinc	.20%	.01 ppm	Standard Method 312B
		Hexavalent Chromium	Less than 10 ug/l	.005 ppm	Hydride
		Arsenic	Less than .005 ppm	0.4 ppm	Flame AA
		Barium	Less than 0.4 ppm	.10 ppm	Flame AA
		Chromium	Less than .10 ppm	.01 ppm	Flame AA
		Cadmium	.02 ppm	.01 ppm	Flame AA
		Lead	0.3 ppm	.001 ppm	Cold Vapor
		Mercury	Less than .001 ppm	.04 ppm	Flame AA
		Silver	Less than .04 ppm	.002 ppm	Hydride
		Selenium	Less than .002 ppm		

Comments: EP TOXICITY ANALYSIS

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy L. Coats

Tracy Coats, Environmental Services

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LOCKWOOD CORPORATION
PO Box 160 • Gering, Nebraska 69341 (308) 436-505 • Telex 484454

May 17, 1984

RECEIVED

JUL 24 1984

DEPARTMENT OF
ENVIRONMENTAL CONTROL

State Of Nebraska
Department Of Environmental Control
Box 94877
Lincoln, NE 68509-4877

ATTENTION: MIKE STEFFENSMEIER

Dear Mr. Steffensmeier:

Per our phone conversation on this date, I am sending the attached lab analysis sheet which was still pending on May 8.

Lab No. 3537 - Spent Acid: This resample of neutralized waste sulphuric acid solution shows a ph of 2.9 which is a non-hazardous waste by corrosive standards. The sample exhibits high levels of chromium and cadmium in EP toxic levels.

This spend acid solution is pumped to the evaporation lagoon on the southwest corner of our property and should be evaporating from this sealed pit. Is it your recommendation that we have a sample well placed to check for possible leaking of contaminants (corrosive and/or toxic)? If we are to install a sample well, could you give us some guidelines on depth, size, location, etc.?

We also have 127 drums of sludge that we had to clean out of the neutralization pit and need your recommendations for safe disposal. This sludge is the material that was tested on Lab No. 2774-4 and was not EP toxic. Your crew resampled this on April 18, 1984, with the results still pending. Can this waste be hauled to our local city landfill for disposal?

We also need disposal recommendations on the preflux tank sludge and the acid tank sludge, both tested nontoxic on lab tests No. 3013-1 and 3013-2. We have four drums of each of these waste sludges.

Cordially,

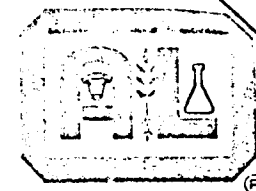
ROY R. DUGAN
GENERAL FOREMAN

RRD/rb

cc B. Knoles

N. Walton

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-086-714

March 26, 1984

Enviro Service #8537
Route #2, Box 118
Scottsbluff, NE 69361

SUBJECT:

Environmental Analysis

Date sampled:

3-13-84

Date received:

<u>Lab No.</u>	<u>Sample Ident.</u>	<u>Analysis</u>	<u>Level</u>	<u>Sensitivity</u>	<u>Method</u>
2774-4	Neutralization Pit	EP Toxicity: Hexavalent Chromium	Less than .007 ppm	0.007 ppm	Flame AA
		Zinc	2800 ppm	0.01 ppm	Flame AA
		Arsenic	0.068 ppm	0.005 ppm	Hydride
		Mercury	Less than .010 ppm	0.010 ppm	Cold Vapor
		Selenium	Less than .005 ppm	0.005 ppm	Hydride
		Lead	3.0 ppm	0.2 ppm	Flame AA
		Cadmium	0.70 ppm	0.1 ppm	Flame AA
		Chromium	0.5 ppm	0.1 ppm	Flame AA
		Barium	Less than 0.3 ppm	0.3 ppm	Flame AA
		Silver	Less than .04 ppm	0.04 ppm	Flame AA

Comments:

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-123-716

May 2, 1984

SUBJECT: Environmental Analysis - EP Toxicity

Enviro Services #8537
Pete Brixius
R 2, Box 118
Scottsbluff, NE 69361

Date sampled:
Date received: 3-28-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
3013-2	Acid Sludge	Zinc	.20%	.01 ppm	Standard Method 312B
		Hexavalent Chromium	Less than 10 ug/l		Hydride
		Arsenic	Less than .005 ppm	.005 ppm	Flame AA
		Barium	Less than 0.4 ppm	0.4 ppm	Flame AA
		Chromium	Less than .10 ppm	.10 ppm	Flame AA
		Cadmium	.02 ppm	.01 ppm	Flame AA
		Lead	0.3 ppm	.01 ppm	Flame AA
		Mercury	Less than .001 ppm	.001 ppm	Cold Vapor
		Silver	Less than .04 ppm	.04 ppm	Flame AA
		Selenium	Less than .002 ppm	.002 ppm	Hydride

Comments: *EP TOXICITY ANALYSIS*

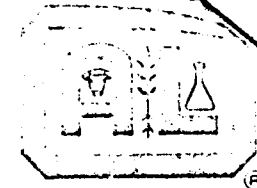
Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy L. Coats

Tracy Coats, Environmental Services

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-123-715

May 2, 1984

SUBJECT: Environmental Analysis - EP Toxicity

Enviro Services #8537
Pete Brixius
R 2, Box 118
Scottsbluff, NE 69361

Date sampled:
Date received: 3-28-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
3013-1	Preflux Sludge	Hexavalent Chromium	Less than 10 ug/l		Standard Method 312B
		Zinc (%)	.10%	.01 ppm	Flame AA
		Arsenic	Less than .005 ppm	.005 ppm	Hydride
		Barium	0.4 ppm	0.4 ppm	Flame AA
		Cadmium	.20 ppm	.01 ppm	Flame AA
		Chromium	Less than .10 ppm	.10 ppm	Flame AA
		Lead	0.5 ppm	0.1 ppm	Flame AA
		Mercury	Less than .001 ppm	.001 ppm	Cold Vapor
		Selenium	Less than .002 ppm	.002 ppm	Hydride
		Silver	Less than .04 ppm	.04 ppm	Flame AA

Comments: EP TOXICITY ANALYSIS

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

A & L MID WEST AGRICULTURAL LABORATORIES, INC.
13611 "B" Street • Omaha, Nebraska 68144 • Phone: 402-334-7770



REPORT NUMBER 4-130-700

May 9, 1984

Enviro Services #8537
Pete Brixius
Rt 2, Box 118
Scottsbluff, NE 69361

SUBJECT: Environmental Analysis - EP Toxicity

Date sampled:
Date received: 4-27-84

Lab No.	Sample Ident.	Analysis	Level	Sensitivity	Method
3537	Spent Acid	EP TOXICITY Arsenic	Less than .010 ppm	.010 ppm	Hydride
		Barium	Less than 0.4 ppm	0.4 ppm	Flame AA
		Cadmium	65 ppm	0.2 ppm	Flame AA
		Chromium	42.1 ppm	.10 ppm	Flame AA
		Lead	4.2 ppm	0.2 ppm	Flame AA
		Mercury	Less than .005 ppm	.005 ppm	Cold Vapor
		Selenium	Less than .002 ppm	.002 ppm	Hydride
		Silver	Less than .04 ppm	.04 ppm	Flame AA
		Hexavalent Chromium	Less than .010 ppm	.010 ppm	Flame AA
		Zinc	2.2%	.01 ppm	Flame AA
		pH	2.9		

Comments:

Respectfully submitted,

A & L MID WEST AGRICULTURAL LABORATORIES, INC.

Tracy Coats

Tracy Coats, Environmental Services

100
6-2184

NEBRASKA DEPARTMENT OF ENVIRONMENTAL CONTROL
WATER & WASTE MANAGEMENT DIVISION
SURVEILLANCE & ANALYSIS SECTION

INVESTIGATION REPORT

SUBJECT: Lockwood Corp.

LOCATION: Gering, NE

INVESTIGATION DATE: April 18, 1984 REPORT DATE: June 20, 1984 by B. Imig

INVESTIGATOR(S): Neil Wheeler & Bill Imig

HANDLED: On Scene X By Telephone

Narrative

PARTICIPANTS

Roy Dugan, General Foreman, Lockwood Corp.
Bill Boyle, Electrical Superintendant, City of Gering
Jerry Carpenter, Water Department, City of Gering
Neil Wheeler, NDEC
Bill Imig, NDEC

INTRODUCTION

Some waste streams of Lockwood Corp. may be classified as hazardous under the Department's rules and regulations. A comprehensive sampling plan was developed and initiated to complete the following objectives:

1. Determine if the evaporation lagoon could be classified as a hazardous waste surface impoundment.
2. Determine if the paint sludge is hazardous.
3. Determine if the sludge from the neutralizer tank is hazardous.
4. Assess the ground water contamination potential of the evaporation lagoon.

SITE DESCRIPTION

Lockwood Corp. is located east of Gering on Hwy. 92 and occupies the east half of SE $\frac{1}{4}$, of Sec. 1, T21N, R55W, Scotts Bluff Co. A chain-link fence encircles the entire property, the major portion of which is undeveloped and

Lockwood Corp.
Page two
June 20, 1984

used for raw product storage. An evaporation lagoon is located on the southern boundary of the property.

The regional ground water flow is east-northeast toward the Platte River. The depth to the water table is approx. 10 feet and the permeability of the undisturbed top soils is rated as moderate (.8-2.5 inches/hour) by the Soil Conservation Service.

DISCUSSION - April 17, 1984

We completed a recon of the area and identified off-site ground water sampling points. We were especially interested in sampling Gering's municipal well #6 which is situated adjacent to the Lockwood property to the east (NW, SE, Sec. 1). We met with Mr. Boyle and Carpenter and arranged with them to have the well started the following morning. They said the well is used sparingly and only in the summer as they have had some turbidity problems with it. Records supplied by Mr. Boyle indicated the depth to static water is 16 feet and 105 feet during pumping. The total depth of the well is 330 feet and it is screened in a confined aquifer.

April 18, 1984

We met with Mr. Carpenter at municipal well #6 at 0800 hours. He said he had been cycling the pump on and off since 0730 hours. When he turned the pump on, the water was turbid but cleared up after several minutes. A sample was collected after pH and temperature measurements stabilized.

At approx. 0830 hours we arrived at Lockwood Corp. and met with Roy Dugan. He accompanied us to all the sites we sampled. We offered to split samples with him but he declined.

The first sampling area was the evaporation lagoon. According to a diagram in the Lockwood file, the dimensions of the lagoon dikes are 120 feet X 120 feet

Lockwood Corp.
Page three
June 20, 1984

and the base is 90 feet X 90 feet. The inlet pipe is located in the SE corner of the lagoon and rises from the dike at a slight angle to about 3 feet above the lagoon's base. There was a circular shaped, eroded area directly under the pipe and about 2½ feet deep. The substrate in the lagoon consisted of multicolored material which, Mr. Dugan identified as salts. This layer was about 6 to 7 inches thick. Below this was dark, wet soil.

Mr. Dugan said that approx. 5,000 gallons of liquid was pumped into the lagoon on April 12, 1984. This volume would cover the base to a depth of about 1 inch. According to SCS evaporation constants for the area, in April, the rate is .1 inches/day. This would allow for the evaporation of about .6 inches and leave .4 inches. The fate of this liquid (about 2,000 gallons) is unknown, either being absorbed by the underlying soils or potentially reaching ground water.

Since there was no free liquid, only sludge samples were collected. The sludge appeared equally distributed over the area, and was uniform in consistency. Because of this, the area was not subdivided, rather random grab samples were taken over a portion of the base and composited.

The next area sampled was the neutralizer tank. This is a concrete tank approx. 20-25 feet long and 6-7 feet deep. There was approx. 1½-2 feet of very wet sludge in the tank which was identical to that in the lagoon.

The last area sampled at Lockwood was the waterfall paint booth. The paint sludge was collected by a Lockwood employee by fishing it out of the water tank under the booth using a metal hook.

After collecting all the samples, a sample receipt was completed and given to Mr. Dugan. We left the plant at approx. 0945 hours.

The last two sample sites were private wells located down gradient of the evaporation lagoon (see attached map). Both wells were pumped until temperature and pH measurements stabilized, then sampled.

SAMPLE RESULTS

The concentrations of leachable metals (Table 1) in the Lockwood samples are below the limits listed for the maximum concentration of contaminants for characteristics of E.P. Toxicity. The data indicates that the metals (leachable and total) with the exception of zinc, are being concentrated in the evaporation lagoon sludge.

High concentrations of total lead, zinc and chromium (Table 2) were detected in the paint sludge. These seem to be complexed and therefore immobile as shown by the leachable concentrations.

The ground water monitoring (Tables 3 & 4) did not reveal any metal concentrations of concern in comparison to the drinking water standards (Table 5).

CONCLUSIONS

Based on the leachable metals concentrations the sludges from the evaporation lagoon, neutralizer tank and waterfall paint booth are not hazardous. Both forms of metals (leachable and total), are being concentrated in the lagoon sludge. The total metals concentration of lead, zinc and chromium were quite high for all three sludges.

Testing of area wells down gradient of the lagoon did not detect significant concentrations of heavy metals. However, this does not rule out the potential that ground water contamination has occurred.

Lockwood Corp.
Page five
June 30, 1984

This potential exists due to the erosion in the floor of the lagoon caused by the impact of water falling from the inlet tube. The depth of this eroded area would be sufficient to breach a seal composed of bentonite or similar material, and allow percolation to the sub-soils and possibly to the water table.

RECOMMENDATIONS

Evaporation Lagoon

1. Require Lockwood Corp. to complete percolation tests in the lagoon to determine the amount of leaching. These tests should be performed in the eroded and unaffected areas.
2. Require Lockwood to install a concrete splash guard under the inlet pipe to protect the seal.

ATTACHMENTS

1. Map showing well locations.
2. Evaporation lagoon diagram.
3. Memo describing hydrogeologic conditions.
4. Survey Plan.

LOCKWOOD CORP.

Table 1

LEACHABLE METALS (E.P. TOXIC)
April 18, 1984

PARAMETER	SAMPLE SITE		
	NEUTRALIZER TANK	LAGOON SLUDGE	PAINT SLUDGE
Arsenic mg/l	.019	.042	.002
Cadmium mg/l	.385	.039	.002 K
Chromium VI mg/l	.003 u	.086	.003 u
Lead mg/l	1.37	2.36	.309
Selenium mg/l	.005 u	.005 u	.005 u
Silver mg/l	.003	.003	.0005 K

Table 2

TOTAL METALS
April 18, 1984

PARAMETER	SAMPLE SITE		
	NEUTRALIZER TANK	LAGOON SLUDGE	PAINT SLUDGE
pH s.u.	1.7	2.7	--
Arsenic mg/kg	1.24	5.42	3.22
Lead mg/kg	675	9,003	18,120
Zinc mg/kg	95,640	34,088	8,050
Chromium mg/kg	12.8	15.4	3,180
Cadmium mg/kg	9.2	11.3	2.0 K
Silver mg/kg	.49	3.98	.5 K
Selenium mg/kg	.005 u	.005 u	.04

u = Analyzed for, but not detected, Method detection limit listed.

K = Actual value known to be less than value given. Method detection limit listed.

GROUND WATER MONITORING NEAR LOCKWOOD CORP.

Table 3

LEACHABLE METALS (E.P. TOXIC)

April 18, 1984

PARAMETERS	SAMPLE SITE		
	MUNICIPAL WELL	PRIVATE A	PRIVATE B
Arsenic mg/l	.011	.020	.022
Cadmium mg/l	.002 K	.002 K	.002 K
Chromium VI mg/l	.003 u	.003 u	.003 u
Lead mg/l	.012	.014	.014
Selenium mg/l	.005	.005 u	.005 u
Silver mg/l	.0005 K	.0005 K	.0005 K

Table 4

TOTAL METALS

April 18, 1984

PARAMETERS	SAMPLE SITE		
	MUNICIPAL WELL	PRIVATE A	PRIVATE B
pH s.u.	7.5	7.7	7.4
Arsenic mg/l	.014	.022	.024
Lead mg/l	.013	.012	.014
Zinc mg/l	.012	.027	.015
Chromium mg/l	.006	.004	.005
Cadmium mg/l	.002 K	.002 K	.002 K
Silver mg/l	.0005 K	.0005 K	.0005 K
Selenium mg/l	.005 u	.005 u	.005 u
Chromium VI mg/l	.003 u	.003 u	.003 u

u = Analyzed for, but not detected. Method detection limit listed.

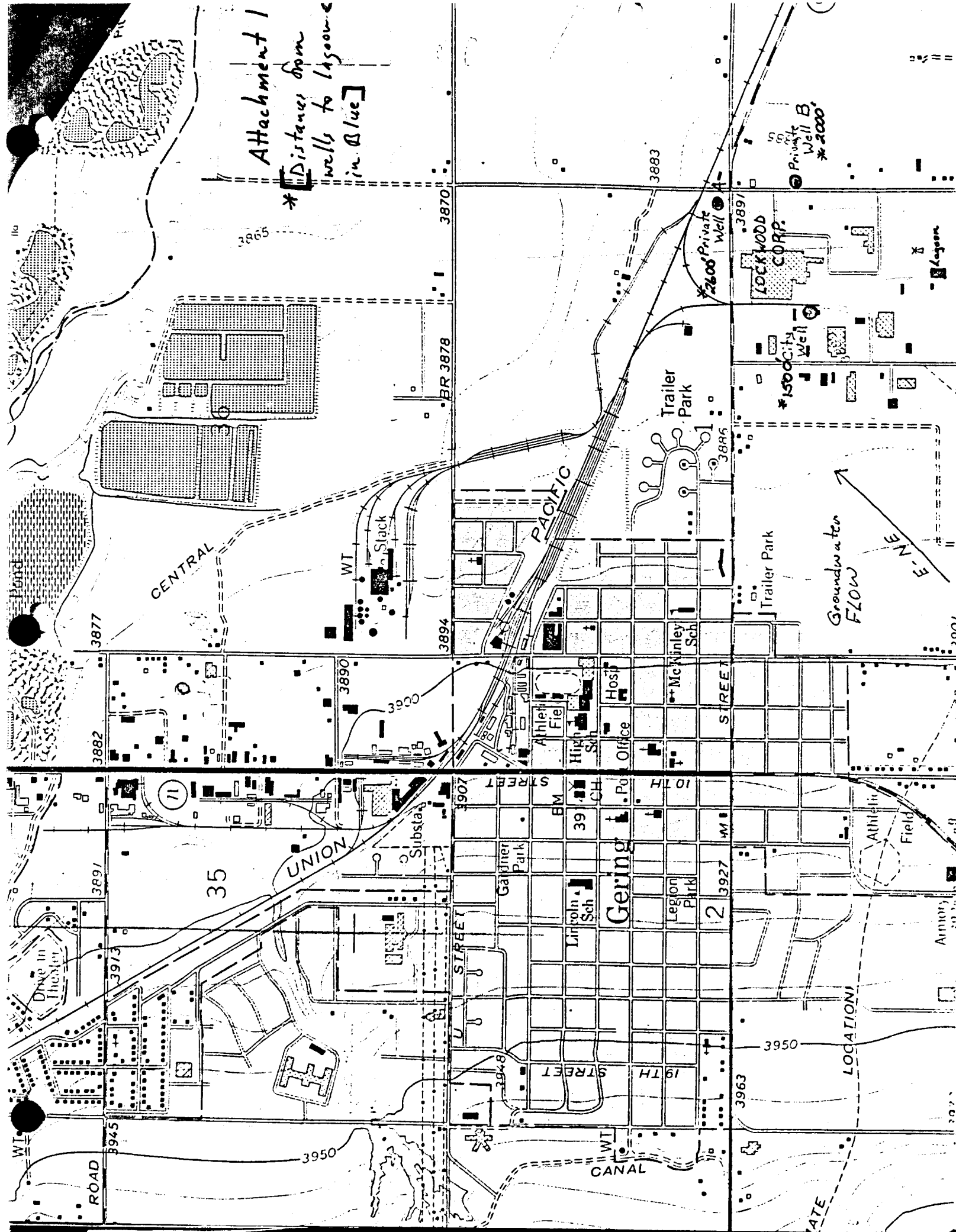
K = Actual value known to be less than value given. Method detection limit listed.

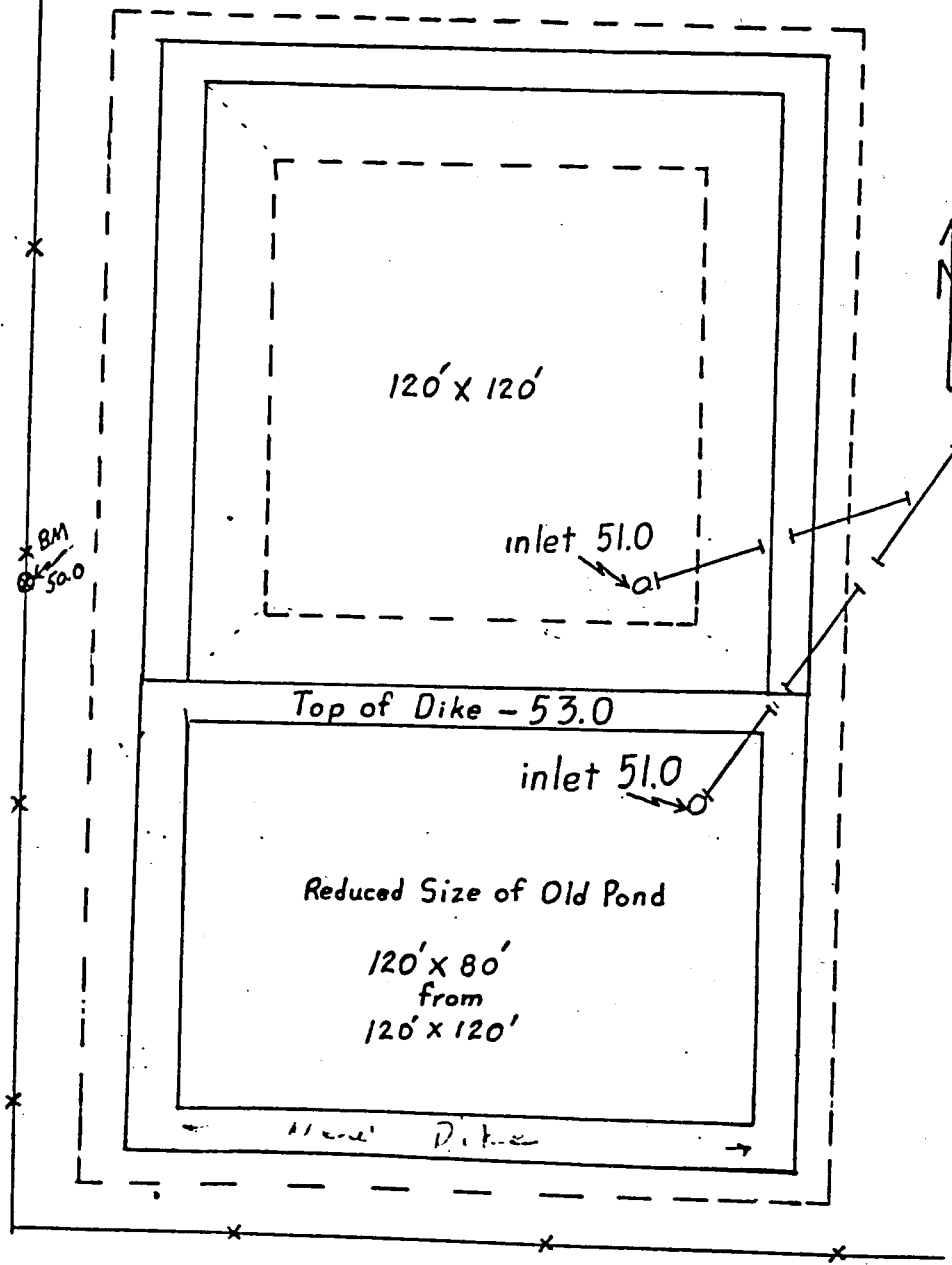
Table 5

DRINKING WATER STANDARDS
SOURCES: U.S. ENVIRONMENTAL PROTECTION AGENCY, 1975 and
WORLD HEALTH ORGANIZATION, EUROPEAN STANDARDS, 1970

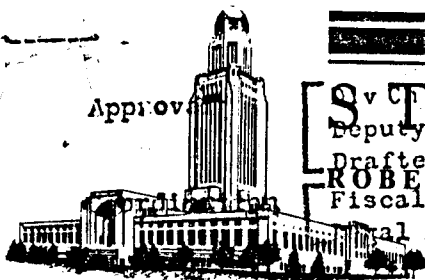
PARAMETER	RECOMMENDED CONCENTRATION LIMIT (mg/l)
Arsenic	.05
Lead	.05
Zinc	5.0
Chromium VI	.05
Cadmium	.01
Silver	.05
Selenium	.01

* [Distance from wells to lagoons in Blue]





Scale - 1" = 40'



Approved

Sv C
Deputy
Drafter
Fiscal

STATE OF
GOVERNOR

CH S/A
HD Brog/Pl
Data Proc.
Engr

CH S/A
HD Lab
HD S/M
Ag

CH S/A
HD Lab
HD S/M
Ag

CH S/A
HD Lab
HD S/M
Ag

CH S/A
HD Lab
HD S/M
Ag

June 20, 1984

Mr. Jim Lane
Industrial Engineer
Lockwood Corporation
P. O. Box 160
Gering, NE 69341

Dear Mr. Lane:

Enclosed is a copy of the Administrative Order sent to your corporate agent on this date. If you have any questions on this Order please call me at (402) 471-4217.

Sincerely,

MS

Mike Steffensmeier, Acting Chief
Hazardous Waste Management Section

MS/th

Enclosure

Copy to: Mike Sanderson, U. S. EPA-Region VII
w/Enclosure

BEFORE THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL CONTROL

IN THE MATTER OF
LOCKWOOD CORPORATION,
A Nebraska Corporation,
Respondent.

)
)
)
)

Case No. 756
ADMINISTRATIVE ORDER

I.

At all times alleged herein, the Respondent, Lockwood Corporation is and was a Nebraska corporation, whose resident agent for service of process was C.T. Corporation, 206 South 13th Street, Suite 1500, Lincoln, Nebraska 68508, and is and was the operator of a irrigation systems construction plant and is and was the holder of the RCRA DEC/EPA I.D. #NED044101442; and the Department of Environmental Control is and was the agency of the State of Nebraska charged with the duty, pursuant to Neb. Rev. Stat. § 81-1505(13) Revised Statutes Supplement, 1983, as amended, of exercising exclusive general jurisdiction of the administration and enforcement of the provisions of Neb. Rev. Stat. §§ 81-1504 through 81-1533, Revised 1983, as amended, and all rules, regulations and orders duly promulgated thereunder.

II.

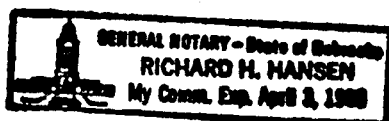
Dennis Grams, Director of the Department of Environmental Control, acting within the scope of his authority pursuant to Neb. Rev. Stat. § 81-1507(4), Revised Statutes Supplement, 1983, as amended, declares that an emergency exists and enters the following Order on June 20, 1984:

State of Nebraska)
) ss.
Lancaster County)

Dennis Grams, being first duly sworn, upon his oath deposes and says that he is the Director of the Nebraska Department of Environmental Control, that he has read the foregoing Order and the facts contained therein are true as he verily believes, that his signature thereon was his own voluntary act and deed and within the scope of his authority.

Dennis Grams
Dennis Grams

Subscribed and sworn in my presence this 20th day of
June, 1984.



Richard H. Hansen
Notary Public

AFFIDAVIT

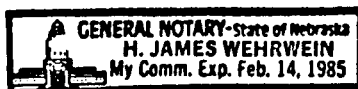
State of Nebraska)
) ss.
Lancaster County)

Vernon T. Hanneman, being first duly sworn, upon his oath, deposes and says as follows:

1. That he is employed by the Nebraska Department of Environmental Control.
2. That on the 21st day of June, 1984, he did mail a copy of the foregoing Order by certified mail, first class, postage prepaid, to the Respondent (or his registered agent),
C. T. Corporation, 206 South 13th Street, Suite 1500,
Lincoln, NE 68508

Vernon T. Hanneman

Subscribed to and sworn in my presence this 21st day of
JUNE, 1984.




H. James Wehrwein
Notary Public

"From the information and observations of representatives of the Department, the Director finds that Respondent is discharging wastes? into an evaporation pond in current use, all in violation of Section 81-1506, Revised Statutes Supplement, 1983, as amended."

THEREFORE, IT IS ORDERED that:

1. Immediately cease discharge of wastes into the evaporation pond currently being used.
2. Within thirty (30) days provide a plan to the Department of Environmental Control, for its approval, for the disposal of sludges in the evaporation pond.
3. Within thirty (30) days complete a hydrogeologic study to determine the extent of contamination of ground water, if any, which may have resulted from the seepage from the evaporation pond and submit a report to DEC. If ground water contamination is detected, inventory and sample all water supply wells which may be affected.

NOW, THEREFORE, IT IS ORDERED that Respondent submit the aforementioned information on the prescribed schedule forthwith or appear before the Department and show cause why they should not be proceeded against for failure to do so.


Dennis Grams, P.E., Director
Nebraska Department of
Environmental Control

M.S.
M.S.

Approval	Div Ch	CH Plans	CH S/A	CH P/E
	Deputy	HD Prog/Pl	HD Lab	HD WM
	Drafter	Data Proc.	HD S/M	HD P/L
Coordination	Fiscal	Grants	Air	MS
	Legal	Engr	Ag	FILE

July 17, 1984

Mr. Roy Dugan
Lockwood Corporation
P. O. Box 160
Gering, Nebraska 69341

RE: DEC/EPA

Dear Mr. Dugan:

As we discussed over the phone on July 16th enclosed is a copy of our investigation report on the sampling done at your facility in April. If you have any questions on the content of the report or note any information errors, please let us know.

Table 2 of the report shows the pH of the neutralizer tank sludge to be 1.7. Because of this low pH, we cannot allow disposal of this material at a landfill as you requested in your May 17, 1984 letter. We recommend the sludge be disposed of as a hazardous waste or further analysis done to verify the material can be safely landfilled. The preflux tank sludge and acid tank sludge mentioned in your May 17th letter should be managed in the same manner.

If you have any further questions please give me a call. I have enclosed a copy of the questionnaire you submitted to our Department as you requested.

Sincerely,

MS

Mike Steffensmeier, Acting Chief
Hazardous Waste Management Section

MS/th
Enclosure

Memorandum

To: Mike Steffensmeier MS

From: Jon Atkinson JA

Through: Clark Haberman GH

Date: September 6, 1984

Subject: Comments on status report (8-27-84) for hydrogeologic investigation:
Lockwood Corporation

As an overview, the report suggests that HWS is conducting a thorough, detailed hydrogeologic study. My specific comments follow.

On page two, Elliott states that the chromium content in the sample from boring B-1 is 0.10 mg/l. According to Table 1, however, chromium content in this sample was measured as less than 0.01 mg/l. This discrepancy in reported concentrations should be resolved.

I assume that all the ground-water samples were collected from unit 2 of the shallow aquifer. If so, the differences in dissolved solids (TDS) content are notable. The relationship between lagoon effluent chemistry and TDS content in ground water from the borings probably should be discussed in the final report. To facilitate this evaluation, at least one representative analysis of effluent should be performed. The preliminary analyses suggest an inverse relationship between chromium and TDS content in the sampled ground water. This relationship may have some geochemical significance.

For future ground-water analyses, I suggest that levels of hexavalent chromium (Cr VI) be determined in addition to total dissolved Cr. The hexavalent is more toxic and, because it is stable and mobile in ground-water environments, may migrate into nearby drinking water aquifers and wells.

HYDROGEOLOGIC INVESTIGATION AND REMEDIAL ACTION PLAN
SPENT ACID EVAPORATION POND
LOCKWOOD CORPORATION
GERING, NEBRASKA

OWNER:

Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

RECEIVED

NOV 9 1984

DEPARTMENT OF
ENVIRONMENTAL CONTROL

PREPARED BY:

Hoskins-Western-Sonderegger, Inc.
825 "J" Street P.O. Box 80358
Lincoln, Nebraska 68508

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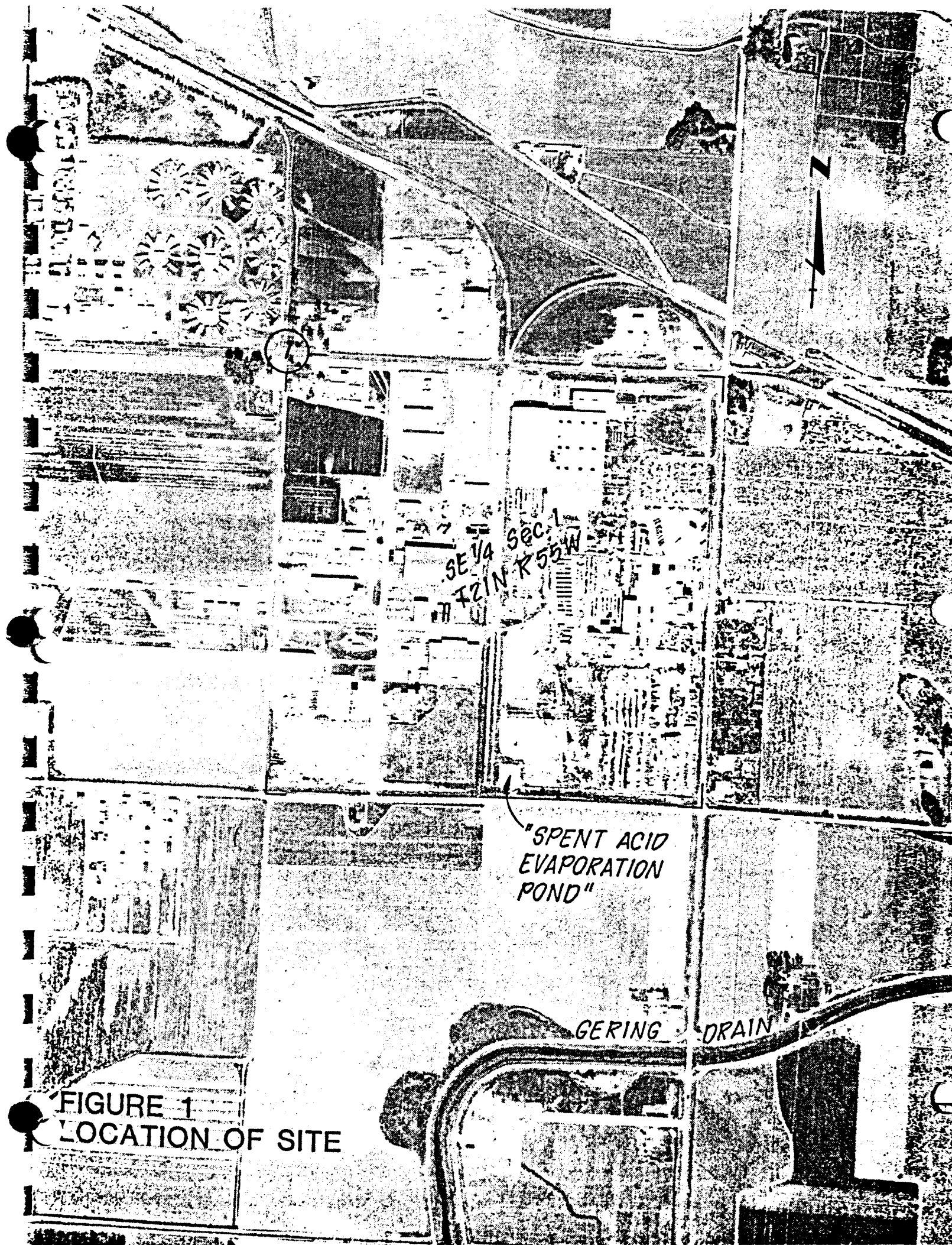
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I. INTRODUCTION

Hoskins-Western-Sonderegger, Inc. performed a hydrogeologic investigation for the Lockwood Corporation, Gering, Nebraska from June to October, 1984. The investigation was in response to an Administrative Order (No. 756) from the Nebraska Department of Environmental Control (June 20, 1984) and involved a study of the Lockwood spent acid evaporation pond and surrounding area to determine the extent and severity of groundwater contamination, if any, resulting from use of the pond. Specifically, the study was to determine if hazardous concentrations of heavy metals had reached the aquifer and, if so, the nature of their movement and recommendations for remedial action or aquifer rehabilitation.

The Lockwood plant is located in the East $\frac{1}{2}$ of the SE $\frac{1}{4}$, Section 1, T21N, R55W in Scottsbluff County, Nebraska (see figure 1). The spent acid evaporation pond is located at the southwest corner of the plant property.

The hydrogeologic investigation consisted of a review of existing data; a field investigation under the direction of a hydrogeologist; and laboratory analyses of soil and groundwater samples. Included in this report are descriptions of the review of existing data and the field investigation procedures; laboratory analyses conducted; and summaries of evaluation procedures and results under the major headings of Geology, Hydrogeology, and Groundwater Quality. Conclusions and recommendations follow and are offered as a framework for future remedial action.



SE 1/4 SEC 1
T2N R55W

"SPENT ACID
EVAPORATION
POND"

GERING DRAIN

FIGURE 1
LOCATION OF SITE

II. CONCLUSIONS & RECOMMENDATIONS

Based on the data to date and the findings of this investigation, we conclude that the chromium/lead/sulfate pollutant plume is the result of a leakage episode initiated by erosion of an effective clay liner. The pollution plume, in at least the westerly and southerly directions, is being naturally neutralized by the alkaline nature of site soils and groundwater. We find the extent of pollution to not exceed 300 to 400 feet from the site and with cessation of evaporation pond use that the pollution has ended.

The use of groundwater in this area is restricted by the industrial nature of land use. The nearest public supply well is over 2,000 ft. from the plume boundary and withdraws groundwater confined in the Brule aquifer. Groundwater flow is controlled by line sources of recharge and discharge which fluctuate with seasonal activities. Groundwater movement through the site is likely to alternate in direction.

Our recommendations are as follows:

1. Instigate closure of the spent acid evaporation pond.
2. Remove the pond sediments and clay liner and dispose of in accordance with NDEC regulations.
3. Cover the site with a silty clay cap not less than 1.0 ft. thick and grade to drain away from the site.
4. Install four (4) groundwater monitoring wells fully penetrating to the top of the Brule formation. Sample these wells on a quarterly bases for a minimum of 1 year and test the samples for chromium, lead, sulfate and specific conductance. If at the end of four (4) quarters no increase in these constituents or parameters occurs, reduce monitoring to biannually for two additional years.

Locations for proposed monitoring wells are indicated on Sheet 1. Figure 6 is a general design for proposed monitoring wells.

5. If monitoring reveals continued outward migration of the polluted groundwater, the monitoring wells shall be used as interceptor wells and a pump test performed on each well by a hydrogeologist. All waters will be directed to the neutralization tank and treated for subsequent disposal.

III. METHODS OF INVESTIGATION

Preliminary data collection included a review of the regional geologic and hydrologic setting, readily available in maps and reports published by the state and U.S. geologic surveys. These included: U.S. Geological Survey Water Supply Paper 943; U.S.G.S. Professional Paper 550-D; Scottsbluff County Test Hole Report; Groundwater Maps (1980); and others.

Information on soil conditions is available in the Soil Survey of Scottsbluff County, a U.S.D.A. Soil Conservation Service publication. Black and white air photos of the area were taken in 1977 and are available at a 1:48,000 scale. Well registration records are available at the State Department of Water Resources and provide drilling logs and water level information. Water quality data are available at the U.S.G.S., the Conservation and Survey Division, and State Health Department. Historical and operational data regarding the spent acid evaporation pond and plant processes were available at Lockwood Corporation.

Field investigation included auger borings at the site according to ASTM Designation D 1452-65 (revised 1980) and sampling by split-barrel sampler according to ASTM Designation D 1586-67 (see Sheet 1). Elevation and location surveys of the boreholes were done. Groundwater sampling from the boreholes was by PVC bailer according to ASTM Designation D 3370. Samples of the various wastes entering the pit were collected. RCRA Chain of Custody requirements for all water and waste sampling were followed. Laboratory analyses of soil and water chemistry were done according to standard methods.

IV. GEOLOGY

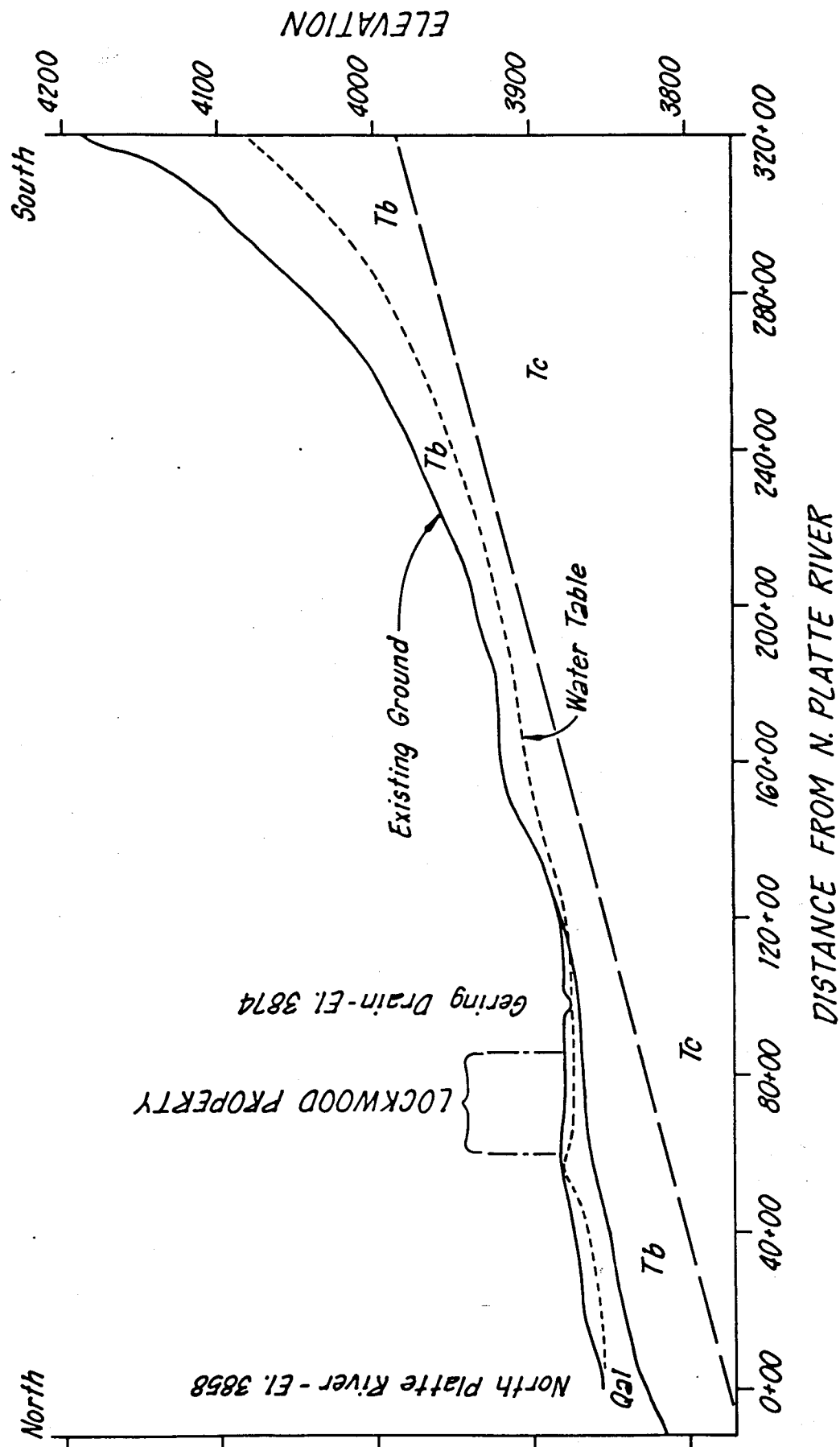
The city of Gering and the Lockwood plant site lie within the North Platte Valley in Scottsbluff County, Nebraska. This area is within the High Plains division of the Great Plains physiographic province. The North Platte Valley was formed from the dissection of the High Plains by the North Platte River and its tributaries. The river and its tributaries have eroded through more than 1,000 feet of tertiary-age sediments. The North Platte River flows from northwest to southeast through Scottsbluff County. The plant site is located approximately two miles south of the river. The river is locally flanked to the north and south by remnants of high terraces which form the valley walls. Some terraces are capped by a thin mantle of gravel which has protected them from erosion. The Lockwood site exists on the Quaternary alluvium (stream-deposited sediment) of the North Platte River's flood plain.

Generally, Cretaceous and Tertiary-age material form the High Plains and underlie this site. This material consists of semi-consolidated to consolidated gravel, sand, silt and clay which was deposited by rivers flowing from the Rocky Mountains. Five formations are representative of the High Plains of Scottsbluff County. The formations exposed in the county are (in ascending stratigraphic order) the Lance, Chadron, Brule, Gering and Arikaree. Not all of these formations were encountered during this investigation. The Gering and Arikaree formations form the upland plateaus and the bluffs and are not present at the site. The sandstone and clay of the Lance formation and the overlying Chadron siltstone are too deep to be of significance in this investigation. This work dealt with the erosional surface of the Brule formation and its thin mantle of

younger alluvial sediment. The Brule underlies the Lockwood site. Figure 2, modified from U.S.G.S. Water Supply Paper 943, summarizes the geology of the area. The Brule formation is a light-colored silt or siltstone, frequently massive in character (that is, not exhibiting bedding or layering). Much of the formation was deposited by ancient streams. Some channel sands occur within the siltstone and volcanic ash accumulated locally, possibly in bodies of standing or slow-moving water (pools in the stream or ponds). Part of the Brule probably consists of eolian (wind-blown) sediment. Grain-size analyses of parts of the Brule are similar in some respects to a loess, being fairly uniform and predominantly silt-sized. The Brule is calcareous, and some lime-cemented zones have greater resistance to weathering, erosion, and the transmission of water. While generally massive or finely laminated, the Brule may weather into a blocky or slabby structure, developing a secondary permeability. This accounts for its ability to transmit water in moderate to large amounts. These openings in the rock have in the past been attributed to fractures (Wenzel, Cady and Waite 1946) but are now thought to occur mainly as natural "piping" (Lowry, 1966). Piping is a process by which channels or conduits are opened by the action of moving water on rocks with limited cohesion.

The alluvium mantling the Brule formation consists of both coarse (sand and gravel) and fine (silt and clay) material. Distribution of the various sediments is complex and related in part to the energy and gradient of the stream, channel shape and source of sediment. While terrace fill and recent alluvium may exceed 200 feet in places along the North Platte Valley in the vicinity of Gering and the Lockwood plant these unconsolidated deposits mantling the Brule bedrock are generally 20 feet thick or less.

FIGURE 2 GEOLOGIC CROSS SECTION



V. HYDROGEOLOGY

Groundwater in the vicinity of Gering, Nebraska and the Lockwood Corporation occurs locally in surficial fill material, and generally in the shallow alluvium and the underlying weathered Brule formation. The sediments in the vicinity of the spent acid evaporation pond can be considered as three hydrogeologic units: (1) an upper unit of silty and sandy clay approximately 7 to 10 feet thick; (2) a sand and gravel unit 10 to 12 feet thick with some interbedded silty and sandy clays; and (3) a semi-consolidated silty clay constituting the weathered surface of the Brule formation. The Brule was encountered at depths of 19 to 25 feet. Groundwater in the alluvium (Unit 2) is unconfined (a "water table" setting) while the groundwater in the Brule is probably semiconfined to confined ("artesian" setting) with impermeable zones or beds within the Brule likely acting as confining beds. Depth to the water table is generally less than ten feet. Direction of regional groundwater flow in the alluvium is east-northeast toward the North Platte River, although locally flow directions are quite different in response to nearby canals, drains, lagoons, wells, and other sources of groundwater recharge or discharge. In the vicinity of the plant site, groundwater flows alternate between north and south, flowing respectively toward the North Platte or toward discharge into the Gering Drain (see Figure 2). This local flow system is believed to be due in part to recharge north of the plant property by an irrigation canal and alternatively to a local line source ditch during summer irrigation season. Sheet 1 shows water level elevations in boreholes near the spent acid evaporation ponds. Direction

of flow within the Brule formation may be different, owing to the different character of that unit and the possibility of secondary permeability (fractures, joints or erosional "piping" structures). Research of available literature and analysis of topographic maps indicates the Lockwood plant site was historically an area of natural groundwater discharge, probably consisting of seeps and marshy conditions for at least part of each typical year. This would cause salt or alkali build-up in the soil and modify soil properties. The "scabby" nature of soil in the area was discussed in the County Soil Survey. This site was not suitable for agriculture. Plant records and soil sampling indicate fill was added prior to pond construction raising the site approximately 2 to 4 feet.

The capacity of a porous material to transmit a fluid is the permeability; the permeability of a material with respect to water is its hydraulic conductivity. Hydraulic conductivity can be estimated by visual inspection of the samples and can be determined in the laboratory. Table 1 summarizes hydraulic conductivity values determined during this investigation.

TABLE 1. AQUIFER PARAMETER OF SITE SOILS

Soil Designation (Unified Soils)	Soil Unit	Saturated Thickness, ft. (m)	Hydraulic Conductivities gpd/ft ²	Transmissivities gpd/ft
Fill (SM)	N.A.	0	0.5 to 10	---
Sandy Clays (CL)	1	0 to 5	5×10^{-5} to 5×10^{-2}	insignificant
Silty Sands (SM)	1	5 to 15	1 to 30	5 to 450
Silty Gravels (GM)	2	5 to 10	5 to 50	25 to 500
Sand (SP)	2	0 to 8	50 to 100	0 to 800

The gradient of the water table across the site varies with the irrigation season. During this investigation there was a slight gradient to the north probably associated with line source recharge provided by a local drain canal parallel to the southern property boundary (Sheet 1). The constant recharge produces a groundwater mound. This mound decays in several days to several weeks after surface flow ceases. Groundwater in the alluvium during evaporation pond use, moved laterally beneath the site hydraulically outward in all directions.

The overall water-transmitting capability of the entire thickness of an aquifer is called the transmissivity (T). This term is defined as the rate of flow in gallons per day through a vertical section of aquifer with a width of one foot and a hydraulic gradient of one. Transmissivity is the product of hydraulic conductivity and thickness.

$$T = \Sigma Kb$$

For example, the maximum transmissivity of the alluvial aquifer at Boring B-1 is:

$$T = (8 \times 2) + (30 \times 4) + 50 \times 7.5 = 511 \text{ gallons/day/foot}$$

Transmissivities of the alluvium in the vicinity of the acid pit range from approximately 300 gpd/ft to 600 gpd/ft.

Transmissivities of the Brule aquifer cannot be directly calculated since drilling did not penetrate any significant thickness of the formation. Estimation of the Brule transmissivity can be made, however, based on yields of wells drilled into the formation. Transmissivity is related to the specific capacity of a well (gallons per minute pumped per foot of drawdown in the well) by the equation

$$T = 2000 Q/S, \text{ where } Q/S \text{ is the well specific capacity.}$$

Transmissivities of the local wells developed in the Brule formation range from 5,000 gpd/ft to 27,000 gpd/ft. Note that these wells penetrate deep into the formation. Large thicknesses of Brule are required to obtain the yield necessary for public supply and irrigation wells. This is an indication of the low permeability of this unit.

Considering the hydrogeology of the pit area in detail, the spent acid evaporation pond was preceded in use by an acid pit. The effectiveness of the pit in retaining acid and metal laden water is unknown. The existing pond was installed with a clay liner under design criteria developed by the U.S. Soils Conservation Service. The liner rests on fill and complex but generally fine-grained alluvium. Logs from borings B-1, B-2, B-3, B-7 and B-8 (the closest to the pits) indicate differing thicknesses and percentages of silt and clay in the upper few feet of sediment (see Appendix I). Samples collected at the new neutralization pit indicate silt and clay (sandy in part) to 6 feet, with clayey sand beginning at that depth. This would infer that (1) a degree of protection exists for the alluvial aquifer, as hydraulic conductivities are somewhat lower in the areas with higher silt and clay content; and (2) the complex distribution of the sandy zones could allow highly variable recharge rates; that is, more infiltrating "recharge" water would flow through some parts of the subsurface than others; and (3) because of these complexities, flow paths to the alluvial aquifer could be extended somewhat in length, with longer travel times resulting. In the saturated zone, the sand and gravel (Unit 2) would transmit water and contaminants more efficiently but the most permeable zones here would also be distributed unevenly. This concept of complex and lengthy flow paths has significance when water quality is considered, especially the cumulative interaction between contaminant and aquifer media.

VI. GROUNDWATER QUALITY

Quality of water in the alluvium and the Brule formation is similar but highly variable. Groundwater is generally a calcium bicarbonate to sodium bicarbonate type. Concentrations of sodium and potassium differ considerably from place to place. Groundwater is hard, although generally water from the Brule formation is somewhat less mineralized. Sulfate concentrations are elevated and approach the recommended drinking water limit (250 mg/l). Total Dissolved Solids values frequently exceed the 500 mg/l recommended drinking water limit. Table 2 gives water quality in selected county wells (Wenzel and others, 1946). Table 3 gives data from the Gering municipal wells (State Health Dept., 1982).

Groundwater samples were collected from the boreholes by bailing, preserved, and transported to Western Laboratories promptly for analysis. Laboratory analyses included the parameters; E.P. toxicity including cadmium, chromium, and zinc; mobile iron; and sulfate. Temperature, pH and specific conductance were measured in the field. Results of these analyses are summarized in Table 4.

Samples were also collected of the Lockwood acid and waste products at different points in the process. These data are not available at this time and will follow in a supplemental report.

Samples of the closest drinking water well, the City of Gering's Well 77-1, were collected. These data are shown in Appendix III and indicate no contamination of this well has occurred. Resampling of the well in August 1984 confirmed the absence of contamination. The pollutants of concern in the groundwater at Lockwood were determined to be Chromium and lead. Because of the high colloid content of water samples

from purged borings we chose to perform several tests on the water samples. The first test was for E.P. Toxicity metals (cadmium, chromium, lead) in the water sample. The second test was for the total metal (chromium, lead) occurring as precipitates attached to clay particles by sample digestion and subsequent analysis. Note in Table 4 that Hexavalent Chromium (Cr VI) was also separated from total chromium as an indication of the toxic fraction. In Table 4 all values except total chromium and Cr VI are mobile or in the groundwater solution.

TABLE 2. ANALYSES OF WATER FROM SOURCES IN SCOTTS BLUFF COUNTY, NEBRASKA, AND ADJACENT AREAS

[Well numbers correspond to numbers in table of well records, pp. 136-148. Parts per million.]

Wells in sand and gravel

Well No.	Owner or point of collection	Depth (feet)	Date of collection	Total dissolved solids	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Total hardness as CaCO ₃	Analyst
	City of Gering	80	Dec. 4, 1937	782			48	22	212		462	182	52	0.0	38	210	W. M. Noble.
	City of Henry	80	Dec. 10, 1937	447			78	22	54		305	124	12	.8	5.9	285	Do.
	Village of Lynn	50 80	Dec. 11, 1937	732			66	18	187		500	160	31	2.0	13	230	Do.
	City of Minatare	60 90	Dec. 4, 1937	633			82	21	122		305	174	32	.6	7.2	291	Do.
	City of Mitchell	83	Dec. 10, 1937	427			74	23	49		281	108	23	.8	11	279	Do.
	City of Morrill	60	do.	487			74	24	69		317	140	13	.6	10	283	Do.
	City of Scottsbluff	100 ±	Dec. 3, 1937	545	28	0.04	89	20	70	4.6	340	130	24	.3	12	301	Do.
15	Frank Thomas	14.3	Dec. 11, 1937								456	410	75	3.3	8.2	315	W. M. Noble.
21	W. G. Parker	41.5	do.								403	200	15	.5	1.4	315	Do.
24	Harvey Harward	29.3	do.								383	230	15	1.1	8.8	303	Do.
49	Otto Jaergens	50.6	Nov. 30, 1936	571			103	19	78		374	157	15	1.2	14	335	M. D. Foster.
98	H. J. Pieper	44.7	Dec. 15, 1937								383	200	17	.4	4.2	315	W. M. Noble.
127	George Emery	26.2	Dec. 14, 1937								369	230	28	1.9	15	126	Do.
195	Harry Pieper	49.6	Dec. 13, 1937	577			80	27	79		325	194	21	.9	6.0	333	Do.
252	Hurry Long	36.8	Dec. 6, 1937								305	180	14	.0	8.0	300	Do.
292	Virgil Trout	59.6	Nov. 30, 1936	432			72	14	65		270	134	9	.6	4.8	237	E. W. Lohr.
409	Ollie Jones	110	Dec. 10, 1937								324	140	58	.3	120	162	Do.

Wells in the Brule formation

17	J. C. Grim	114.5	Dec. 11, 1937								291	30	30	0.6	25	58	W. M. Noble.
32	Mrs. Frank Moritz	140	do.								192	80	11	.3	5.9	189	Do.
37	School District	76.8	do.								259	190	11	.0	4.7	267	Do.
78	School land	77.4	Dec. 14, 1937								266	110	34	.1	6.9	188	Do.
88	F. G. Tanner Estate	34.2	do.								423	200	29	.2	17	234	Do.
150	J. B. Schrock	48.7	Dec. 3, 1937								224	110	10	.3	4.7	195	Do.
168	S. A. Burkey	89.7	Dec. 2, 1937								240	22	10	.0	29	201	Do.
172	Mrs. Addie Lewis	62.0	Dec. 14, 1937								350	90	67	.9	25	74	Do.
209	Joe McCoy	68.1	Dec. 3, 1937								257	170	11	.0	8.8	237	Do.
259	F. E. McClanahan	17.6	Dec. 13, 1937								1,065	400	195	2.2	17	52	Do.
272	Andrew Oleson	142.3	Dec. 3, 1937								294	110	17	.6	20	44	Do.
275	Carl Thomas	63.6	do.								262	170	13	.3	15	273	Do.
277	Ola Mitchell	66.6	do.								263	150	11	.4	11	225	Do.
303	Mrs. D. L. Hawbaker	83.6	Dec. 6, 1937								226	16	5	.6	9	112	Do.

TABLE 3

Community	Sampled	pH	TS	Fe	Mn	F	Alk	Hard	Ca	NO ₃	Cl	SO ₄	Na
<u>Gering</u>													
53-3 (7)	7-76	7.8	824	0.0	0.0	0.30	368	272	86	6.4	66	201	135
58-1 (8)	7-76	7.3	744	0.0	0.0	0.25	340	256	94	0.8	34	230	97
58-2 (9)	7-76	7.6	592	0.0	0.0	0.26	264	264	88	1.4	20	203	68
58-3 (10)	7-76	7.6	718	0.0	0.0	0.28	320	276	91	4.5	44	195	96
61-1 (T1)	7-76	7.7	584	0.1	0.0	0.31	252	260	83	1.6	20	225	76
65-1 (T2)	7-76	7.7	608	0.0	0.0	0.28	272	272	88	1.6	24	206	75
65-2 (T3)	7-76	7.6	702	0.0	0.0	0.29	316	256	86	2.8	26	255	108
76-1	10-77	8.1	968	0.0	0.0	0.93	396	132	38	5.2	120	191	350

TABLE 4. WATER ANALYSIS FOR GROUNDWATER SAMPLES, HWS BOREHOLES
(Specific Conductance in μmhos ; pH in Standard pH units;
all other parameters in mg/L, Sampling 24 hours after drilling)

BORING NO:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Back-ground
Specific Conductance	1,200	NA	3,100	3,200	4,100	2,450	2,800	2,100	1,600	8,200	1,750	1,200	800	1,300	1,200	1,500	1,200 -1,300
pH	8.3	NA	8.7	8.6	8.4	8.5	8.6	8.5	8.2	7.9	8.2	7.6	7.6	7.7	7.7	7.5	7.5-8.1
Cadmium	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	0.1	<0.05	NA	<0.05	<0.05	0.12	0.10	0.15	<0.05	<0.05	0.10	<0.05	<0.05	0.13	<0.05	0.14	<0.05
Total Cr	0.26	0.32	0.32	<0.05			NOT ASSESSED					1.65	1.55	2.00	1.56	1.56	<0.05
Cr VI**	NA						NOT ASSESSED					NA	<0.05	0.12	0.15	0.05	<0.05
Lead	NA						NOT ASSESSED					NA	0.01	0.05	0.01	0.06	<0.10
Total Pb	NA						NOT ASSESSED					NA	2.04	2.98	2.38	2.32	1.93
Iron	1.69	3.87	1.95	1.88	1.89	0.82	2.13	<0.01	0.47	0.40	0.41	ND	ND	ND	ND	ND	ND
Sulfates	915		1,183	1,012	508	NA	375	234	323	1,295	349	263	241	287	300	265	140-230
Radial Separation(R.S.) from Acid Pond	35'	15'	(25)*	35	115	(45)	45	40	80	60	160	215	230	150	220	190	
R.S. from Erosion Pond P#2	165'	55	140	145	185	160	195	150	210	150	265	325	385	260	265	325	

* (25) - Boring below area of abandoned and reclaimed acid pond.

** Cr VI - Hexavalent Chromium as a fraction of Total Chromium.

VII. FINDINGS

The results of the hydrogeologic investigation can be summarized as follows:

1. Groundwater contamination in the fill and alluvial aquifer at the evaporation pond site have occurred as a result of erosion of the clay liner at the point of spent acid discharge. Consequently, the opening permitted rapid seepage through the pond bottom and into the underlying soils and groundwater.
2. The most significant pollutants are chromium and lead. Additional groundwater constituents have shown increases in concentration, including zinc, sulfate and iron.
3. The pollutant plume was rapidly neutralized by the naturally alkaline soils and groundwater and the toxic metals immobilized by precipitation. (i.e. EP Toxicity of chromium in solution are equivalent to 1% to 8% of total chromium in digested aquifer samples.)
4. The ratios of hexavalent chromium to total chromium ranges from 0.5% to 3.8% in digested samples.
5. Analysis of major aquifer parameters including Specific Conductance (Figure 3) and pH (Figure 5) and concentration of sulfates vs. distance (Figure 4) indicate that neutralization of the plume and/or maximum radial excursion does not exceed 300 ft. to 400 ft. from the point of seepage, the erosion pit.

The decline in pH away from the site is believed to be associated with the final leakage of neutralized solutions which had been rendered alkaline.

FIGURE 3
SPECIFIC CONDUCTANCE OF GROUNDWATER

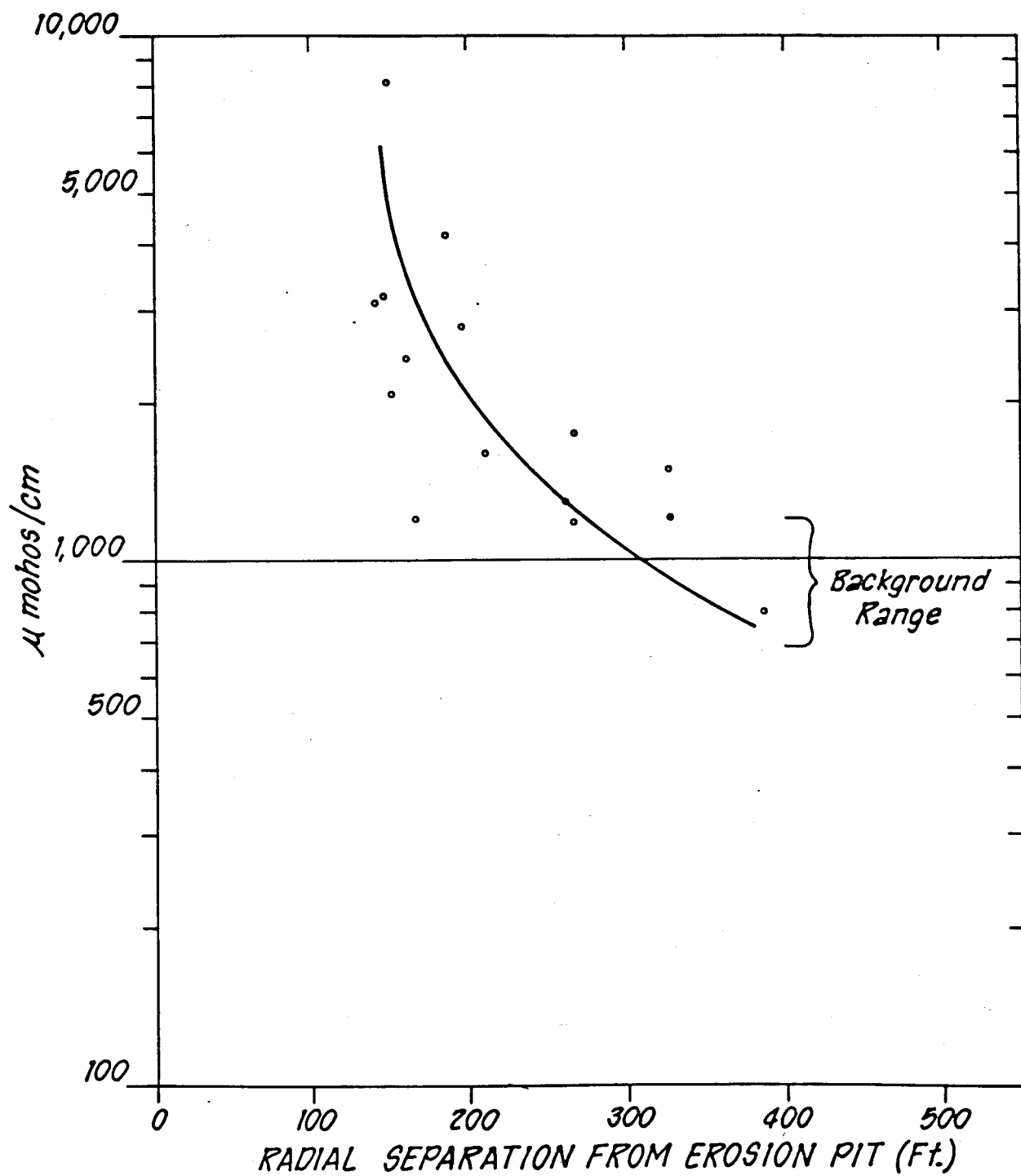


FIGURE 4 SULFATES IN GROUNDWATER

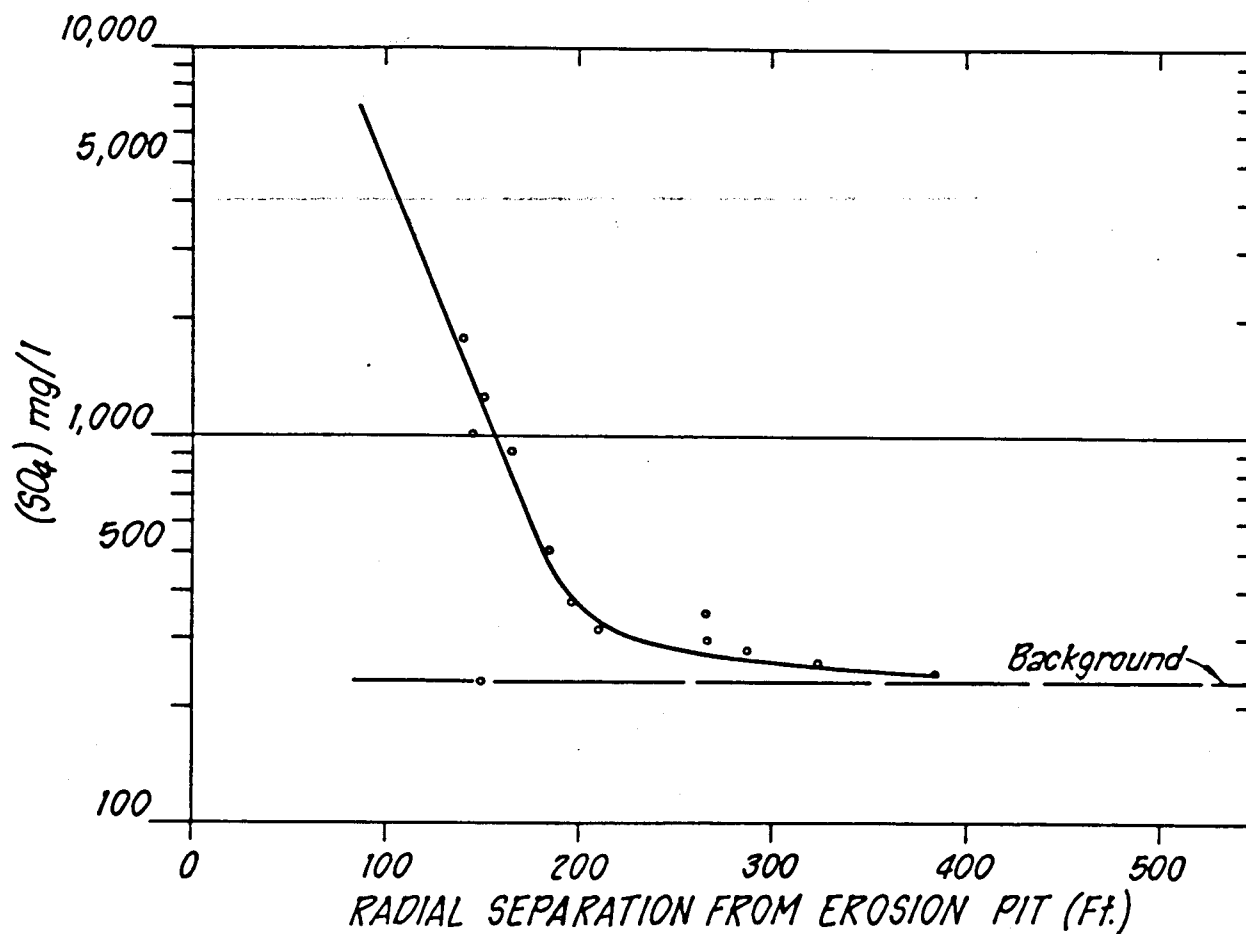
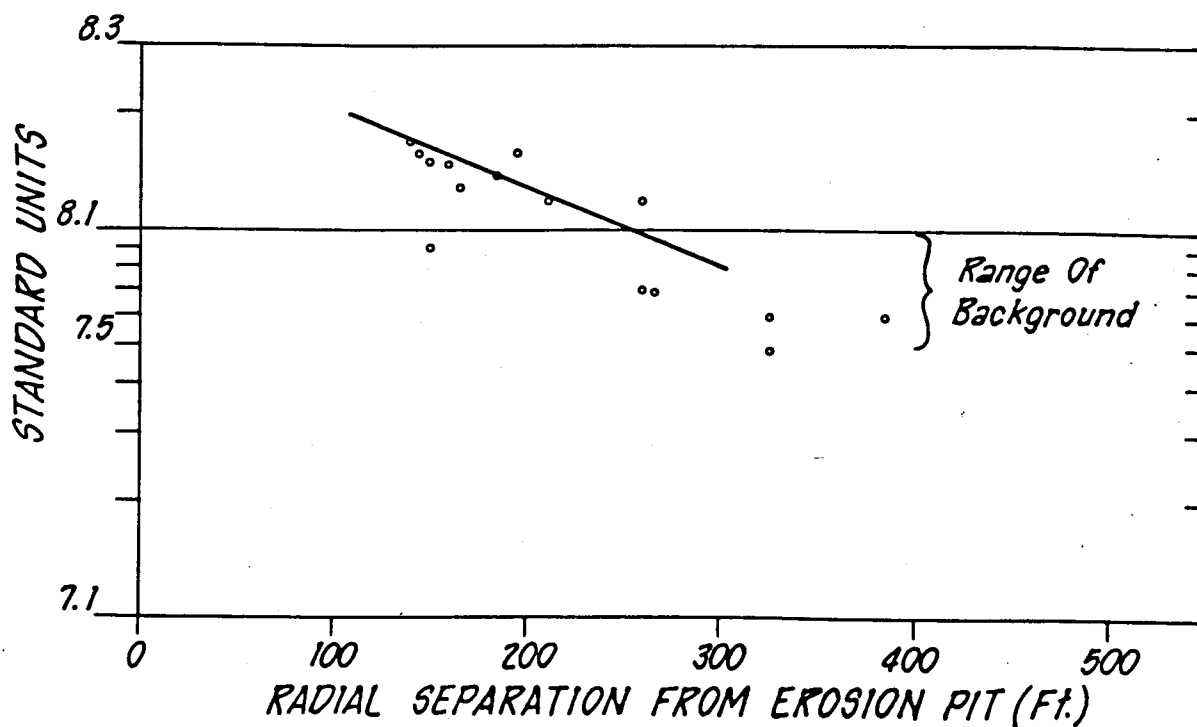


FIGURE 5 ph OF GROUNDWATER



6. Chromium concentrations decrease from as high as 0.35 mg/l to 0.13 mg/l in the southerly direction from the pond in 120 feet from Boring 3 to Boring 14. The same constituent decays in concentration from 0.15 mg/l to 0.04 mg/l within 180 feet from Boring 8 to Boring 12. This decay supports the findings in item 5 above. These decays in chromium concentration represent a 0.1% to 0.3% decrease per foot of plume.
7. Mobilized pollutants can be extracted by interceptor wells, precipitated metals cannot; their removal would require acid leaching and subsequent interception with a ring of interceptor wells.



STATE OF NEBRASKA

ROBERT KERREY • GOVERNOR • DENNIS GRAMS • DIRECTOR

June 27, 1984

Mr. Jerry Carpenter
Gering Water Dept.
1450 10th Street
Gering, Nebraska 69341

Dear Mr. Carpenter:

I have enclosed the water quality analysis data for Gering's municipal well #6 and two private wells in the area.

The metal concentrations in Table 3 reflect only the dissolved portion in the water. The metal concentrations in Table 4 reflect the amounts dissolved in the water and attached to the sediment. Table 5 lists the Drinking Water Standards for the respective metals.

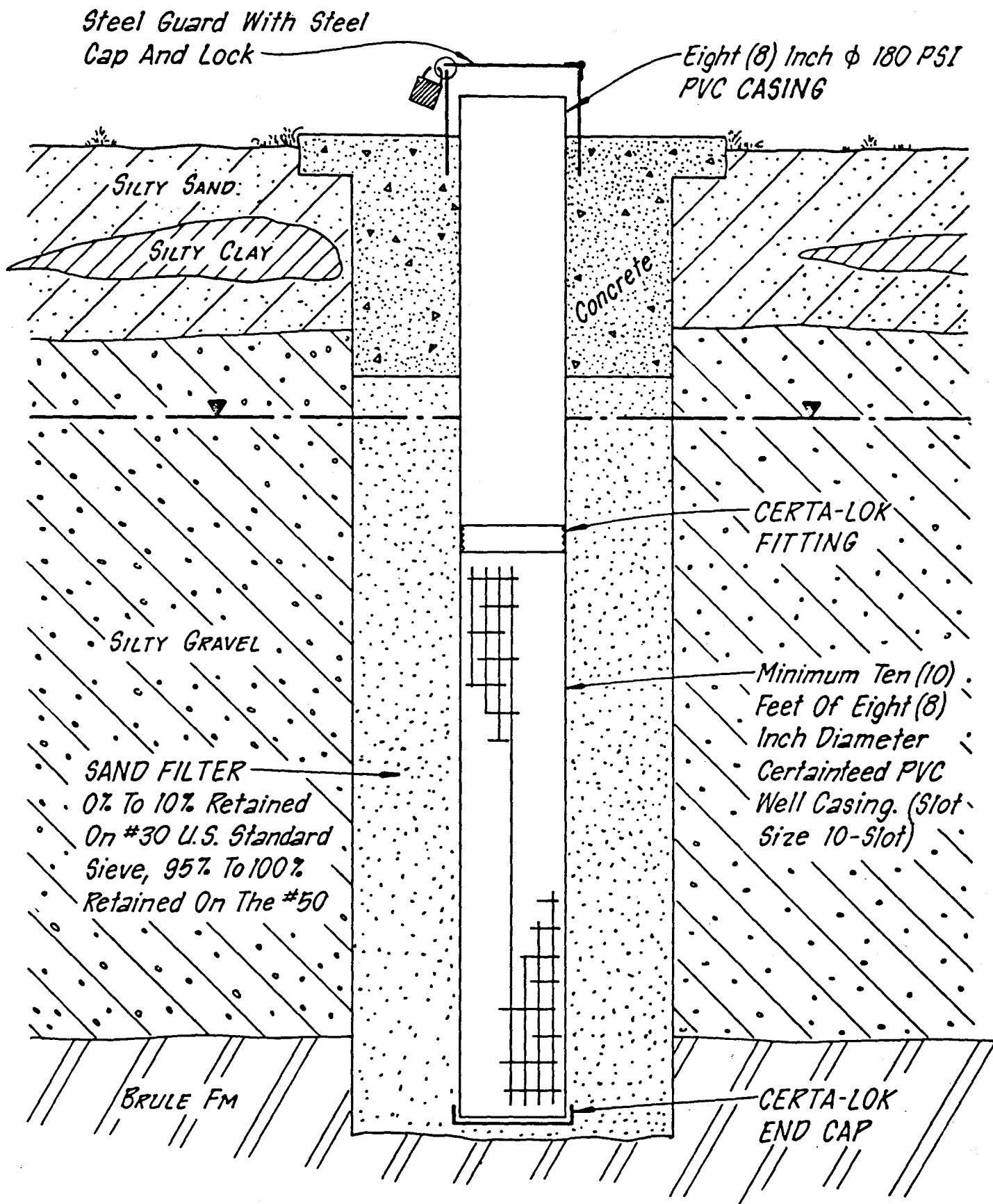
As you can see, all the metal concentrations are within the maximum recommended levels. If you have any questions, please contact me at (402) 471-4230.

Sincerely,

Bill Imig
Environmental Specialist
Surveillance & Analysis Section
Water & Waste Management Division

BI/tsk
enclosure

FIGURE 6 MONITORING WELL DESIGN



GROUND WATER MONITORING NEAR LOCKWOOD CORP.

Table 3

LEACHABLE METALS (E.P. TOXIC)

April 18, 1984

PARAMETERS	SAMPLE SITE		
	MUNICIPAL WELL	PRIVATE A	PRIVATE B
Arsenic mg/l	.011	.020	.022
Cadmium mg/l	.002 K	.002 K	.002 K
Chromium VI mg/l	.003 u	.003 u	.003 u
Lead mg/l	.012	.014	.014
Selenium mg/l	.005	.005 u	.005 u
Silver mg/l	.0005 K	.0005 K	.0005 K

Table 4

TOTAL METALS
April 18, 1984

PARAMETERS	SAMPLE SITE		
	MUNICIPAL WELL	PRIVATE A	PRIVATE B
pH s.u.	7.5	7.7	7.4
Arsenic mg/l	.014	.022	.024
Lead mg/l	.013	.012	.014
Zinc mg/l	.012	.027	.015
Chromium mg/l	.006	.004	.005
Cadmium mg/l	.002 K	.002 K	.002 K
Silver mg/l	.0005 K	.0005 K	.0005 K
Selenium mg/l	.005 u	.005 u	.005 u
Chromium VI mg/l	.003 u	.003 u	.003 u

u = Analyzed for, but not detected. Method detection limit listed.

K = Actual value known to be less than value given. Method detection limit listed.

Table 5

DRINKING WATER STANDARDS
SOURCES: U.S. ENVIRONMENTAL PROTECTION AGENCY, 1975 and
WORLD HEALTH ORGANIZATION, EUROPEAN STANDARDS, 1970

PARAMETER	RECOMMENDED CONCENTRATION LIMIT (mg/l)
Arsenic	.05
Lead	.05
Zinc	5.0
Chromium VI	.05
Cadmium	.01
Silver	.05
Selenium	.01

August 27, 1984

Nebraska Department of Environmental Control
Box 94377, State House Station
301 Centennial Mall South
Lincoln, Nebraska 68509

ATTENTION: Mike Steffensmeier, Acting Chief
Hazardous Waste Management Section

REFERENCE: Lockwood Corporation Case No. 756
Status Report on Hydrogeologic Investigation

Dear Mr. Steffensmeier:

A preliminary hydrogeologic investigation has been performed at Lockwood Corporation, Gering, Nebraska. The investigation is in response to Nebraska Department of Environmental Control, Administrative Order of June 20, 1984, item 3.

An extension was requested and received with deadline set at August 27th, 1984. This letter represents the status report of findings and conclusions to date concerning the groundwater setting in and about the Lockwood spent acid lagoons.

The purpose of the investigation were to determine 1) if toxic levels of leachable metals had reached the aquifer 2) if so, the nature of the metals excursion and 3) remedial action for aquifer restoration.

Included in the investigation are the following items:

1. Review of existing soil and geologic reports and review of registered well logs.
2. A subsurface investigation by auger borings at the site according to ASTM Designation D 1452-65 (Revised 1980) and sampling with split-barrel sampler according to ASTM Designation D 1586-67, Groundwater sampling in bore holes by PVC bailer according to ASTM Designation D 3370.
3. Analysis of groundwater samples include cadmium, chromium, zinc, iron, sulfates in mg/l and the parameters: temperature, pH and specific conductance.

Please find attached Sheet 1, a boring plan for the site, Table 1, Analysis of Lagoon and Groundwater Samples compiled from NDEC Investigation Report dated April 18, 1984 and IHS laboratory analysis of August 15, 1984. These documents are preliminary and subject to addition and revision in the final report.

PRELIMINARY FINDINGS

The results of a preliminary subsurface investigation within 150 radial feet of the spent acid lagoons revealed a three unit aquifer consisting of a upper unit (1) of silty and sandy clay ranging in thickness from 7.0 ft to 10.0 ft; a sand and gravel unit (2) composed of a combination of siliceous and carbonate grains and a silty clay/ gravelly clay unit (3) the weathered surface of the Brule Formation. Unit 2 ranges in thickness from 10 ft to 12 ft and contained interbedded silty and sandy clays. Unit 3 acts as an aquitard at the site and was penetrated at each boring at a depth of between 19.5 ft and 25.0 ft.

Groundwater occurrence at the site is unconfined in unit 2 and semiconfined to confined in the Brule Formation underlying the weathered unit 3. Flow in unit 2 is regionally toward the North Platte River but locally north to south. This flow results from recharge at the north property boundary by an irrigation canal and discharge to the south by the Gering Drain. Flow in the Brule Fm. was not assessed.

Local wells including the Gering Municipal Well #77-1 and several registered irrigation wells all are deeply penetrating the Brule Fm. This is the consequence of low transmissivity in this aquifer unit.

Groundwater quality in the Brule Fm. is variable but generally calcium bicarbonate and sodium bicarbonate according to U.S. Geologic Survey Water-Supply Paper 943, 1946. Nebraska Department of Health records indicate the Gering Municipal well has sodium-bicarbonate type water. We requested sampling of this well on 3/5/84 and testing specifically for chromium.

The preliminary groundwater analysis results are as follows:

1. Chromium concentrations range from 0.05 mg/l to 0.15 mg/l within 150 radial ft of the lagoons.
2. Chromium concentration diminishes significantly away from the lagoons in areas of occurrence. (see Table 1 and Sheet 1)
 - a. B-8, cr = 0.15 mg/l to B-11, cr = 0.10 mg/l; separation = 120 ft
 - b. B-1, cr = 0.10 mg/l; B-9 cr 0.05 mg/l; separation 43 ft
3. Groundwater conditions are alkaline and suitable to precipitation of chromium from solution as a salt.
4. Zinc concentrations range from 0.01 mg/l to 1.31 mg/l.

5. Additional borings and sampling at greater radial separation will be necessary to determine the furthest occurrence of chromium from the lagoons.
6. Lack of etching on carbonate grains in units 1 and 2 indicate alkaline conditions and not acid corrosion of the grains.

CONCLUSIONS & RECOMMENDATIONS

Our conclusions are based on a limited number borings. We are currently extending the radius of investigation in all directions and expect to have the results of groundwater sample analysis in two to four weeks time.

Based on data to date we have made the following conclusions:

1. Lagoon leakage occurred in the north pond in association with clay liner erosion at the terminus of the discharge pipe.
2. Naturally high alkalinity provides a groundwater environment suitable for precipitation of heavy metals.
3. Dilution and/or precipitation of chromium from groundwater occurs within the immediate vicinity of the lagoons. Further investigation is in progress to determine the concentration gradient.
4. Zinc and cadmium, although present at high concentrations in the pond sludges, precipitate out of infiltrating solutions in the alkaline soil and groundwater.
5. Absence of etching on carbonate grains indicate decay of the infiltrating spent acid front to normal or alkaline pH in the upper few inches to feet of the underlying soils. This is consistent with the SCS soil survey of Scotts Bluff County - 1968 which indicates the pre-site conditions as a wet variant of the Mitchell Silt loam and "scabby". This was a natural groundwater discharge site and as a result had developed a high concentration of salts prior to use due to evaporation.

We recommend the following actions:

1. Complete the subsurface investigation at 200 to 250 radial feet from the ponds.
2. Instigate closure of the spent acid lagoons.
3. Install four (4) groundwater monitoring wells fully penetrating unit 2. Sample these wells on a quarterly basis for 1 year and test the samples for the presence of chromium cadmium, zinc, iron, sulfates, pH and specific conductance. If at the end of one year, no evidence exists of significant increase in these constituents or changes in the parameters reduce monitoring to biannual for two additional years. Location and design of the wells will be submitted at completion of the investigation.

4. If spent acid liquors are to be disposed of at this facility repair of the clay liner or construction of lined evaporation pond will be appropriate for protection of the groundwater.

We respectfully request your permission to extend the date of completion of the hydrogeologic investigation to September 24, 1994.

Sincerely,

HOSKINS-WESTERN-SONDEREGGER, INC.

By

Roy W. Elliott

Certified Professional Geologist #6694

RHE/vm

34/3936

Enclosure

1 cc: Ray Dugan, General Foreman
Lockwood Corp.

1 cc: Gary Brandt

Table 1 Analysis of Lagoon & Groundwater Samples

Parameters	Recommended Concentration Limit (mg/l)	Municipal Well #6 4/18/84	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11
			----- (6/29/84) -----										
Arsenic	0.05	0.014	-----N.A.-----										
Lead	0.05	0.013	-----N.A.-----										
Zinc	5.0	0.012	<0.01	1.13	1.31	0.15	0.02	0.04	<0.01	<0.01	0.03	0.05	0.03
Chromium	0.05	0.006	^{0.10} <0.01	<0.05	NA	<0.05	<0.05	0.12	0.10	0.15	<0.05	<0.05	0.10
Cadmium	0.01	0.002*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	0.05	0.005*	-----Not Assessed-----										
Selenium	0.01	0.005	-----Not Assessed-----										
Chromium VI	0.05	0.003'	-----Not Assessed-----										
pH	NA	7.5	8.3	NA	8.7	8.6	8.4	8.5	8.6	8.5	8.2	7.9	8.2
Specific Conductance			1200	NA	3100	3200	4100	2450	2800	2100	1600	8200	1750
Sulfates			915	NA	1183	1012	508	NA	375	234	323	1295	349
Iron			1.69	3.87	1.95	1.88	1.89	0.82	2.13	<0.01	0.47	0.40	0.41

* At or below detection limit

' Not detected

Memorandum

To: Mike Steffensmeier

From: Jon Atkinson JA

Through: U. Gale Hutton

Date: November 21, 1984

Subject: HWS Hydrogeologic Investigation and Remedial Action Plan
for Lockwood Corp., Gering, NE

Regarding recommendation 4 (p.2), I suggest that water levels be measured in the monitoring wells prior to collection of each water sample. Measuring water levels will document changes in the ground-water flow system (e.g., head gradients, flow directions).

Based on information in the report (p.11), I infer that water samples for dissolved metals analysis were not filtered in the field. Because the samples were high in suspended-sediment content, field filtering is preferred to minimize concentration changes caused primarily by sorption or desorption processes and subsequently to yield a theoretically more accurate measure of in situ dissolved content. For future monitoring of dissolved lead and chromium content, I suggest that water samples containing noticeable content of suspended solids be filtered in the field. Further, I recommend continued determination of hexavalent chromium (dissolved) concentrations.

I question the validity of the locations for two of the proposed monitoring wells. Based on the stated rationale for the locations (p.3) -- documentation of continued outward migration of pond contaminants -- I recommend that the wells be positioned near the edge of the plume. Therefore, in my estimation, the proposed wells along the western dike of the lagoon system should be moved westward to be approximately in line with boring B-11. Interpreting dissolved chromium data in Table 4, the western edge of the plume is between B-11 and B-12.

Based on positive dissolved chromium results for B-6 and B-14, I suggest placing an additional monitoring well south of the lagoons, about 50 feet west of B-14. Also, because ground-water flow is northward at times and because B-16 recorded a significant amount of dissolved chromium (0.14 mg/l), an additional well at or very near B-16 may be prudent.

In finding 6. (p.13), HWS asserts that chromium content in ground water decreases southerly from B-3 to B-14. I question the validity of this geochemical interpretation because a total chromium level of 0.35 mg/l is compared to a dissolved content of 0.13 mg/l. The valid geochemical interpretation is based on comparison of dissolved levels. No dissolved analysis is available for B-3. However, comparing the dissolved value -- 0.12 mg/l -- for nearby B-6 with that for B-14 suggests a uniform concentration southward rather than a concentration "decay".

/ds

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II A-11; II A-1; II A-12; II A-2; II A-13;
II A-3; II A-14; II A-4

LABORATORY IDENTIFICATION NO.: 16793

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.035		SD
Chromium	mg/L	0.20		SD
Lead	mg/L	1.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	970		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Id Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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ATTENTION: Gary Brandt/ Roy Elliott
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JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II A-15; II A-5

LABORATORY IDENTIFICATION NO.: 16794

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	<0.005	1/104	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.020		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	<0.1		SD
Mercury	mg/L	<0.005		SD
Selenium	mg/L	<0.005	1/103	SD
Silver	mg/L	<0.1	1/114	SD
Zinc	mg/L	660		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

John Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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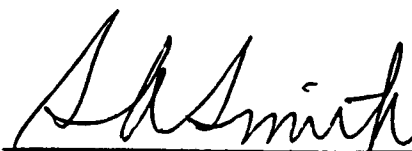
CLIENT/FIELD IDENTIFICATION: II B-1; II B-11; II B-2; II B-12; II B-3;
II B-13; II B-4; II B-14

LABORATORY IDENTIFICATION NO.: 16795

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	<0.005	1/104	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.030		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	0.1		SD
Mercury	mg/L	0.012		SD
Selenium	mg/L	<0.005	1/103	SD
Silver	mg/L	<0.1	1/114	SD
Zinc	mg/L	980		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By



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ANALYTICAL SERVICES

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FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II B-5; II B-15

LABORATORY IDENTIFICATION NO.: 16796

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.020		SD
Chromium	mg/L	0.08		SD
Lead	mg/L	0.1		SD
Mercury	mg/L	0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	0.1	1/114	SD
Zinc	mg/L	520		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II C-1; II C-11; II C-2; II C-12; II C-3;
II C-13; II C-4; II C-14

LABORATORY IDENTIFICATION NO.: 16797

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.025		SD
Chromium	mg/L	0.12		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Cu	mg/L	930		SD

Tests were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Ad Smith

WESTERN LABORATORIES
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DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II C-5; II C-15

LABORATORY IDENTIFICATION NO.: 16798

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	<0.005	1/104	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.015		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	<0.1		SD
Mercury	mg/L	<0.005		SD
Selenium	mg/L	<0.005	1/103	SD
Silver	mg/L	<0.1	1/114	SD
Zinc	mg/L	340		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By



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ANALYTICAL SERVICES

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DATE: Nov. 27, 1984

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FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: II D-1; II D-11; II D-2; II D-12; II D-3;
II D-13; II D-4; II D-14

LABORATORY IDENTIFICATION NO.: 16799

	Units	Concentration	Book/Page	Analyst
Acute Toxicity	mg/L	< 0.005	1/104	SD
	mg/L	< 0.5		SD
	mg/L	0.030		SD
	mg/L	0.12		SD
	mg/L	1.3		SD
	mg/L	< 0.005		SD
	mg/L	< 0.005	1/103	SD
	mg/L	0.2	1/114	SD
	mg/L	1300		SD

performed in accordance with procedures published in the Federal Register, Vol. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 233, Dec. 18, 1979.

By

Al Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

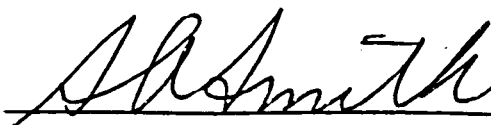
CLIENT/FIELD IDENTIFICATION: B 1-A

LABORATORY IDENTIFICATION NO.: 16801

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	0.05		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By



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REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 1-C

LABORATORY IDENTIFICATION NO.: 16803

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.055	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	1.5		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

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DATE: Nov. 27, 1984

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FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 1-D

LABORATORY IDENTIFICATION NO.: 16804

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	0.10		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	1.7		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By *Al Smith*

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

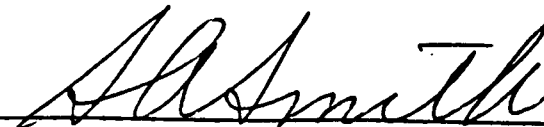
CLIENT/FIELD IDENTIFICATION: B 3 - 3.5-4.0

LABORATORY IDENTIFICATION NO.: 16805

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.010		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	120		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By



WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

Western-Sonderegger, Inc.
34/2810

ANALYST: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

ISS NUMBER 32/2005

DATE RECEIVED: 7/18/84

CLIENT/PROJECT IDENTIFICATION: B 3 - 10.5-11.0

LABORATORY IDENTIFICATION NO.: 16806

Analysis	Units	Concentration	Book/Page	Analyst
Metals, As	mg/L	< 0.005	1/104	SD
Arsenic	mg/L	< 0.5		SD
Mercury	mg/L	0.030		SD
Lead	mg/L	0.07		SD
Cadmium	mg/L	< 0.1		SD
Copper	mg/L	< 0.005		SD
Chromium	mg/L	< 0.005	1/103	SD
Vanadium	mg/L	< 0.1	1/114	SD
Barium	mg/L	230		SD

performed in accordance with procedures published in the Federal Register, No. 233, Dec. 3, 1979 and as amended in the Federal Register, December 18, 1979.

SD Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 3 - 19.5-20.0

LABORATORY IDENTIFICATION NO.: 16807

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.040		SD
Chromium	mg/L	0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	1200		SD

Tests were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Al Smith

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ANALYTICAL SERVICES

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825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 5-D

LABORATORY IDENTIFICATION NO.: 16818

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	<0.005	1/104	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	<0.005		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	<0.1		SD
Mercury	mg/L	<0.005		SD
Selenium	mg/L	<0.005	1/103	SD
Silver	mg/L	<0.1	1/114	SD
Zinc	mg/L	2.9		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

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DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 7-C

LABORATORY IDENTIFICATION NO.: 16830

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	< 0.05		SD
Copper	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Molybdenum	mg/L	< 0.005	1/103	SD
Nickel	mg/L	< 0.1	1/114	SD
Vanadium	mg/L	2.3		SD

were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Al Smith

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ANALYTICAL SERVICES

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DATE: Nov. 27, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/2810

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2005

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: B 8-C

LABORATORY IDENTIFICATION NO.: 16836

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.005	1/104	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.005		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	0.007		SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	< 0.1	1/114	SD
Zinc	mg/L	0.19		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By



WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED:

SAMPLE OF: Soil

LABORATORY IDENTIFICATION NO.: As Noted Below

DESCRIPTION:

Composite of the following samples from evaporation Pit #I

<u>Lab No.</u>	<u>Client No's.</u>
17005	IA-A, IA-2, IA-3, IA-4, IA-11, IA-12, IA-13, IA-14
17006	IA-15, IA-5
17007	IB-1, IB-2, IB-3, IB-11, IB-12, IB-13, IB-14
17008	IB-15, IB-4, IB-5
17009	IC-1, IC-2, IC-3, IC-11, IC-12, IC-13, IC-14
17010	IC-15, IC-4, IC-5
17011	ID-1, ID-2, ID-3, ID-11, ID-12, ID-13, ID-14
17012	ID-15, ID-4, ID-5

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

325 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IA-11, IA-12; IA-13; IA-14; IA-1; IA-2;
IA-3; IA-4

LABORATORY IDENTIFICATION NO.: 17005

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.028	1/105	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.015		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	<0.1		SD
Mercury	mg/L	<0.005	1/131	SD
Selenium	mg/L	<0.005		SD
Silver	mg/L	0.10	1/112	SD
Zinc	mg/L	150		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Al Smith

WESTERN LABORATORIES
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DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IA-15; IA-5

LABORATORY IDENTIFICATION NO.: 17006

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	< 0.005	1/105	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.015		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005	1/131	SD
Selenium	mg/L	< 0.005	1/102	SD
Silver	mg/L	0.01	1/112	SD
Zinc	mg/L	200		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Al Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IB-1; IB-2; IB-3; IB-11; IB-12; IB-13;
IB-14

LABORATORY IDENTIFICATION NO.: 17007

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.024	1/105	SD
Barium	mg/L	< 0.5	1/100	SD
Cadmium	mg/L	0.008	1/97	SD
Chromium	mg/L	0.10	1/99	SD
Lead	mg/L	0.24	1/98	SD
Mercury	mg/L	< 0.005	1/131	SD
Selenium	mg/L	< 0.005	1/102	SD
Silver	mg/L	< 0.01	1/96	SD
Zinc	mg/L	124	1/116	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

AS Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderregger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IB-15; IB-4; IB-5

LABORATORY IDENTIFICATION NO.: 17008

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.006	1/105	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.005		SD
Chromium	mg/L	0.01		SD
Lead	mg/L	0.24		SD
Mercury	mg/L	<0.005	1/130	SD
Selenium	mg/L	<0.005		SD
Silver	mg/L	<0.01	1/112	SD
Zinc	mg/L	100		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IC-1; IC-2; IC-3; IC-11; IC-12; IC-13;
IC-14

LABORATORY IDENTIFICATION NO.: 17009 (Extractor)

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.015	1/105	SD
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	0.025		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	< 0.1		SD
Mercury	mg/L	< 0.005		SD
Selenium	mg/L	< 0.005	1/130	SD
Silver	mg/L	0.20	1/112	SD
Zinc	mg/L	350		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: IC-15; IC-4; IC-5

LABORATORY IDENTIFICATION NO.: 17010 (Shaker)

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.041	1/105	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.015		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	<0.1		SD
Mercury	mg/L	<0.005	1/130	SD
Selenium	mg/L	<0.005		SD
Silver	mg/L	<0.01	1/112	SD
Zinc	mg/L	210		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

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WESTERN LABORATORIES
ANALYTICAL SERVICES

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225 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

NUMBER: 84/2810

DATE RECEIVED: 7/18/84

IDENTIFICATION: ID-1; ID-2; ID-3; ID-11; ID-12; ID-13;
ID-14

LABORATORY IDENTIFICATION NO.: 17011

	Units	Concentration	Book/Page	Analyst
E.P. Toxicity				
Lead	mg/L	<0.005	1/105	SD
Cadmium	mg/L	<0.5		SD
Chromium	mg/L	0.010		SD
Copper	mg/L	<0.05		SD
Iron	mg/L	0.12		SD
Mercury	mg/L	<0.005	1/130	SD
Nickel	mg/L	0.005	1/102	SD
Silver	mg/L	<0.01	1/112	SD
Zinc	mg/L	150		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

Sh Smith

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ANALYTICAL SERVICES

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Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 7/18/84

CLIENT/FIELD IDENTIFICATION: ID-15; ID-4; ID-5

LABORATORY IDENTIFICATION NO.: 17012

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	0.005	1/105	SD
Barium	mg/L	<0.5		SD
Cadmium	mg/L	0.025		SD
Chromium	mg/L	0.13		SD
Lead	mg/L	3.8		SD
Mercury	mg/L	<0.005	1/130	SD
Selenium	mg/L	<0.005	1/102	SD
Silver	mg/L	<0.01	1/112	SD
Zinc	mg/L	310		SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

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DATE: Dec. 4, 1984

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FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 9/4/84

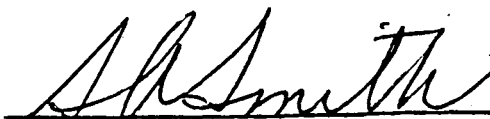
CLIENT/FIELD IDENTIFICATION: B-12

LABORATORY IDENTIFICATION NO.: 17078

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	Not Determined		
Barium	mg/L	<0.5		SD
Cadmium	mg/L	<0.005		SD
Chromium	mg/L	<0.05		SD
Lead	mg/L	0.01		SD
Mercury	mg/L	<0.005	1/54	SD
Selenium	mg/L	<0.005	1/103	SD
Silver	mg/L	Not Determined		
Zinc	mg/L	0.05		SD
Metals, Total				
Cadmium	mg/L	0.005	1/80	SD
Chromium	mg/L	1.65	1/79	SD
Chromium, Hexavalent	mg/L	<0.05	1/78	SD
Lead	mg/L	2.04	1/80	SD
Mercury	mg/L	0.011	1/130	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

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DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 9/4/84

CLIENT/FIELD IDENTIFICATION: B-13

LABORATORY IDENTIFICATION NO.: 17079

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	Not Determined		
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	< 0.05		SD
Lead	mg/L	0.05		SD
Mercury	mg/L	< 0.005	1/54	SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	Not Determined		
Zinc	mg/L	0.04		SD
Metals, Total				
Cadmium	mg/L	0.007	1/80	SD
Chromium	mg/L	1.55	1/79	SD
Chromium, Hexavalent	mg/L	0.12	1/78	SD
Lead	mg/L	2.98	1/80	SD
Mercury	mg/L	< 0.005	1/130	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

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Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 9/4/84

CLIENT/FIELD IDENTIFICATION: B-14

LABORATORY IDENTIFICATION NO.: 17080

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	Not Determined		
Barium	mg/L	<0.5		SD
Cadmium	mg/L	<0.005		SD
Chromium	mg/L	0.13		SD
Lead	mg/L	0.01		SD
Mercury	mg/L	<0.005	1/54	SD
Selenium	mg/L	0.025	1/103	SD
Silver	mg/L	Not Determined		
Zinc	mg/L	0.05		SD
Metals, Total				
Cadmium	mg/L	<0.005	1/80	SD
Chromium	mg/L	2.00	1/79	SD
Chromium, Hexavalent	mg/L	0.15	1/78	SD
Lead	mg/L	2.38	1/80	SD
Mercury	mg/L	0.005	1/130	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

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825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 9/4/84

CLIENT/FIELD IDENTIFICATION: B-15

LABORATORY IDENTIFICATION NO.: 17081

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	Not Determined		
Barium	mg/L	< 0.5		SD
Bismuth	mg/L	< 0.005		SD
Bromine	mg/L	< 0.05		SD
Cadmium	mg/L	0.06		SD
Mercury	mg/L	< 0.005	1/54	SD
Selenium	mg/L	0.005	1/103	SD
Silver	mg/L	Not Determined		
Zinc	mg/L	0.03		SD
Metals, Total				
Cadmium	mg/L	< 0.005	1/80	SD
Chromium	mg/L	1.56	1/79	SD
Chromium, Hexavalent	mg/L	0.05	1/78	SD
Lead	mg/L	2.32	1/80	SD
Mercury	mg/L	0.007	1/130	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Dec. 4, 1984

REPORT NO.: 84398 (Partial)

FOR: Hoskins-Western-Sonderegger, Inc.
Job No. 84/3936

ATTENTION: Gary Brandt/ Roy Elliott
REFERENCE: Lockwood

JOB NUMBER: 84/2810

DATE RECEIVED: 9/4/84

CLIENT/FIELD IDENTIFICATION: B-16

LABORATORY IDENTIFICATION NO.: 17082

Analysis	Units	Concentration	Book/Page	Analyst
Metals, E.P. Toxicity				
Arsenic	mg/L	Not Determined		
Barium	mg/L	< 0.5		SD
Cadmium	mg/L	< 0.005		SD
Chromium	mg/L	0.14		SD
Lead	mg/L	< 0.01		SD
Mercury	mg/L	< 0.005	1/54	SD
Selenium	mg/L	< 0.005	1/103	SD
Silver	mg/L	Not Determined		
Zinc	mg/L	0.04		SD
Metals, Total				
Cadmium	mg/L	< 0.005	1/80	SD
Chromium	mg/L	1.56	1/79	SD
Chromium, Hexavalent	mg/L	< 0.05	1/78	SD
Lead	mg/L	1.93	1/80	SD
Mercury	mg/L	< 0.005	1/130	SD

Analyses were performed in accordance with procedures published in the Federal Register, Vol. 44, No. 233, Dec. 3, 1979 and as amended in the Federal Register, Vol. 44, No. 244, December 18, 1979.

By

SA Smith

Memorandum

TO: Mike Steffensmeier *MS*
FROM: Dave Kargbo *DK*
DATE: December 10, 1984
RE: Hydrogeological Investigation and Remedial Action Plan,
Lockwood Corporation, Gering, Nebraska

In their bid to propose a remedial action plan for contaminants, that may have leached to ground water from Lockwood's spent acid evaporation pond, Hoskins-Western-Sonderregger, Inc. (HWS) has made some effort in this regard. There remains however some serious questions about the hydrogeological implications and geochemical interpretations of the investigation performed by HWS. A few of these questions and suggested answers are highlighted below:

1. Any ground water monitoring system should possess at least one monitoring well to collect background samples (CFR 265.91(1)). It's uncertain if there is any proposed well outside the limit of the waste management area. Two of the wells (in Northeast and Southeast directions) are of considerable and equal distance from the pond. If both are out of the influence of the pond, then in addition to the two proposed wells close to the west side of the pond, a third well should be constructed westward assuming this is the downgradient direction (CFR 265.91(2)).
2. Results of parameters are presented for background but no indication in the Methods section as to how they were obtained.
3. Soil samples, especially close to the water table surface should have been analyzed especially if ground water fluctuates greatly. This will provide information on the concentration of mobile (or potentially mobile) parameters in the soil that may eventually reach ground water. Results of these analyses may provide a different ratio (from that cited in Finding #3, p. 12) of the E. P. Toxicity Cr to Total Cr.
4. The 7th Finding (p. 13) proposes to acid-leach precipitated metals. Such a practice would lead to a host of problems that include:
 - a) Dissolving other potential pollutants in addition to target metals.
 - b) Wide range of solutes that would dissolve and leach, leading to increase in ground water specific conductivity.
 - c) Decrease in pH of ground water.
 - d) Substantial destruction of soil microbe population depending on duration and strength of the acid treatment. This may lead to increased nitrate (NO₃) leaching to ground water.

5. Finding #6 (p. 13) is very confusing because of the following:
- a) No indication as to what Cr is being referred to.
 - b) Assuming the authors are describing E. P. Toxic Cr, although the most southerly boring (B-14) had .13 mg/L Cr, no boring read .35 mg/L.
 - c) Total Cr and Cr (VI) were not assessed (NA) even in borings where E. P. Toxic Cr was found to be high (Table 4: B-1, B-6, B-7, B-8, B-11). Cr (VI) is most mobile and is of greatest concern. In the areas where it was assessed it was mostly higher than E. P. Toxic Cr (except B-16). Considering that the E. P. Toxic Cr for the NA borings is higher than for the assessed wells (except B-14, B-16), it would have been necessary to determine Cr (VI) in all the borings.

From the ground water sample results (Table 4), the only certain decay is in a westerly direction (Sheet #1) and this may be the direction of flow. The study should have been designed to determine a flow rate and direction(s) of flow. This is especially necessary not only because of regulatory concerns (CFR 265.93(a)(2)) but due to the possibility of the flow direction(s) and rate(s) being influenced by the easterly flow in the Gering Drain and southern line source recharge by a local drain canal. If the assumption of flow in all directions is assumed, a gross flow rate should be estimated that averages over all spatial interactions.

6. Table 4 indicates high concentrations of sulfates (SO_4^{2-}) possibly from the spent sulphuric acid (H_2SO_4) leaching from the pond to the ground water. Although the pH is high due to the presence of carbonates (Na_2CO_3 , CaCO_3), the presence of high sulfates may pose a problem if the sulfates are reduced to sulphides (S^{2-}). A sulphide bearing waste has the characteristics of reactivity (CFR 261.23(a)(5)) if when mixed with water at pH 2-12.5, it generate toxic hydrogen sulphide (H_2S). Reductions of SO_4^{2-} to S^{2-} may take place in waters of high COD or high BOD, indicating anaerobic conditions. Neither the reducing status (as TOC) nor the S^{2-} concentration of the ground water was determined. Pursuant to CFR 265.92(b)(2)(3), TOC and TOH (in addition to other parameters) must be determined to assess ground water contamination.

Although only secondary requirements (i.e., no enforceable regulatory threshold set) have been established for SO_4^{2-} concentration in ground water (250 ppm, drinking quality), Lockwood should bear in mind that with time the SO_4^{2-} plume may reach surrounding wells and will thus cause human health problems.

Lockwood Corporation, Gering, Nebraska
Hydrogeologic Investigation and Remedial Action Plan
Memorandum
Page 3
December 10, 1984

7. I realize it is very difficult to filter suspended solids in the field immediately following sampling. These suspended solids must however be analyzed for in the lab. Based on soil texture and concentration of suspended solids, one may have considerable adsorption of target metals on solid surfaces such that E. P. Toxic results may be rendered uninformative. I recommend in future therefore determination of suspended solids.
8. Finally, I would like to add that data on background surface elevation should be evaluated annually (CFR 265.93(f)) to determine whether requirements for locating the monitoring wells continue to be satisfied. If these requirements (pursuant to CFR 265.91(a)) are no longer satisfied, then Lockwood should be prepared to modify the number, location or depth of the proposed monitoring wells.

DK/th

WS

Hoskins • Western • Sonderegger, Inc.
P.O. Box 80358 825 J Street
Lincoln, Nebraska 68501
402/475-4241

December 19, 1984

RECEIVED

JAN 7 1985

Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

DEPARTMENT OF
ENVIRONMENTAL CONTROL

ATTENTION: Mr. Roy Dugan

REFERENCE: Supplemental Report - Hydrogeologic Investigation and
Remedial Action Plan Spent Acid Evaporation Pond

Dear Sir:

Soil samples from the evaporation pond sediments, the clay liner and the underlying alluvial soils have been analyzed for EP Toxicity, metals. Attached is exhibit I Western Laboratories Analytic reports (Dec 4 & Nov 27 1984, #84398) summaries of the analytic results are presented in tables I, II, and III. Figure 1 is a plot of the sampling locations including pond quadrants sites and auger boring locations.

Hydrogeologic investigation revealed the presence of chromium, lead and mercury in excursion from the pond. Excursion has occurred in a silty gravel aquifer beneath the ponds. Chemical analysis of saturated sediment samples and groundwater samples provides evidence that the metals have precipitated out of solution and only a fraction remains mobile. Methods of analysis include total metals in saturated sediments, EP Toxicity metals in saturated sediments and total metals in groundwater. The conditions of extractions for "totals" and EP Toxicity are rigorous and acidic. The natural hydrogeologic setting is alkaline. Our conclusions are that the naturally alkaline conditions at the site neutralize the acidic fluids within a short distance immobilizing the toxic metals. This conclusion is supported by the chemical analyses (Table 4 and Figures 3 and 4, Hydrogeologic Investigation and Remedial Action Plan). The concentrations of sulfates and chromium decay with distance from the evaporation ponds. Chromium concentrations decay at 0.1% to 0.3% per foot from the evaporation pond. Specific conductance of the ground water also diminishes with radial separation from the ponds.

Our findings, based on evaluation of the EP Toxicity analysis of pond, liner and soil sediments are as follows:

1. The evaporation pond sediments, the clay liner and underlying soils are non-hazardous.
2. Mobil toxic metals in the groundwater are remnant of a single short term excursion resulting from erosion of the clay liner and subsequent leakage into the underlying aquifer.

Professional Services for 40 Years

3. Natural alkalinity is neutralizing the acid front and immobilizing the toxic metals.
4. With cessation of evaporation pond use the source of pollution has ended.

Based on these findings we offer the following recommendations:

1. Instigate closure of the evaporation ponds. Monitor the groundwater as recommended in the Hydrogeologic Investigation and Remedial Action Plan.
2. Encapsulate the abandoned ponds with a silty clay cover with positive, radial drainage.
3. We find no cause for removal of underlying soils and do not recommend treatment or removal.

If you have any questions concerning this letter or our recommendations, please contact myself or Mr. Brandt at your convenience.

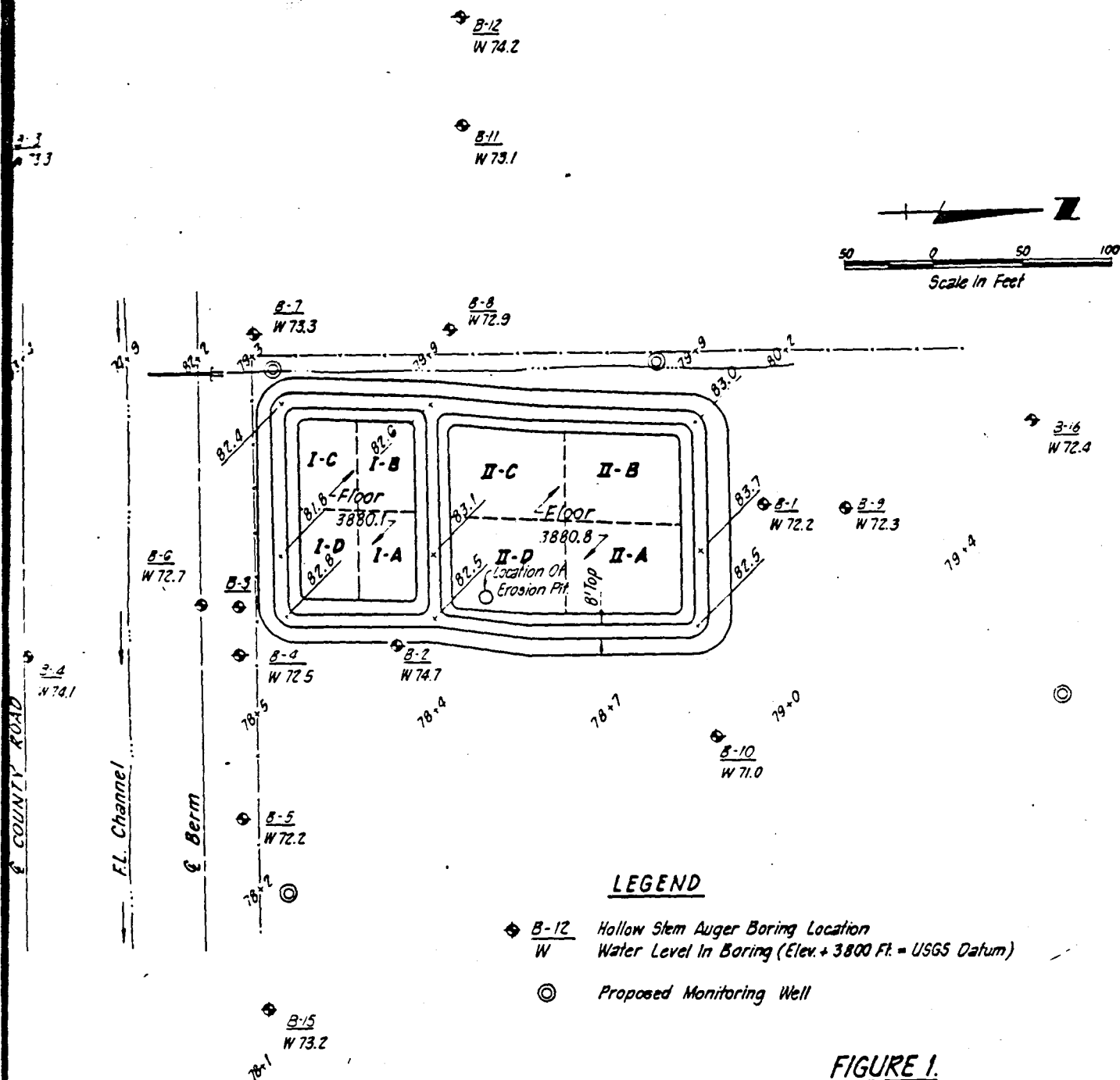
Sincerely,

HOSKINS-WESTERN-SONDEREGGER, INC.

By _____

Roy W. Elliott
Hydrogeologist

RWE/vm
84/3936
Attachment
1 cc: Gary Brandt



LOCATION OF SOIL BORINGS AND SAMPLING QUADS



Hoskins • Western • Sonderegger, Inc.
P.O. Box 80358 825 J Street
Lincoln, Nebraska 68501
402/475-4241

January 8, 1985

RECEIVED

Nebraska Department of Environmental Control
Hazardous Waste Division
301 Centennial Mall South
Lincoln, Nebraska 68508

JAN 9 1985

**DEPARTMENT OF
ENVIRONMENTAL CONTROL**

Attn: Mr. M. Steffensmeier
Acting Chief-Hazardous Waste

Ref: Hazardous Waste Investigation
Lockwood Corp., Gering, NE

Dear Roy:

The enclosed sheet summarizes the results of laboratory analyses that were performed on samples obtained from the storage barrel lots at Lockwood Corporation. Laboratory Sample No. 17135 thru 17138 are of waste sludge stored in barrels on site. Sample No. 17268 thru 17271 are of sludges taken from Evaporation Pond No. II on the initial visit to Lockwood by our personnel.

The EP toxicity analysis of the waste sludge from the barrels reflects generally what was found of the waste sludge in the evaporation ponds. The saturated paste PH of the sludges from the various storage barrel lots ranges from between 2.0 to 12.5, and the concentrations of the EP toxic metals are below R.C.R.A. maximum permissible limits.

Roy Dugan of the Lockwood Corporation has already received the test results. We are submitting this summary for your review and comment and will await your recommendations on suggested methods of disposing of these sludges.

Sincerely,

HOSKINS-WESTERN-SONDEREGGER, INC.

By Donel H. Kuhlman
Donel H. Kuhlman, P.E.

DHK/nh
84/3936
Enclosure
cc: Roy Dugan

Memorandum

TO: Mike Steffensmeier *MS*
FROM: Dave Kargbo *DK*
DATE: January 14, 1985
RE: Supplemental Report, Lockwood Corporation

The supplemental report compiled by HWS addressed some of the concerns that I had about their original Hydrogeological Investigation and Remedial Action Plan for Lockwood. A few of their findings and recommendations, however, warrant some comments.

The contention that mobile toxic metals in the ground water are a remnant of a single short-term excursion of contaminant plume is questionable. Analysis of soil samples was done on composite samples from a depth of up to four feet. An examination of Zn results in the pit where erosion of the clay liner had taken place clearly shows a continual movement of plume downwards. All the composite samples from the top four feet (0-4') have higher Zn content (930 - 1,300 ppm) than the bottom (4-5') composite samples (340-600 ppm).

Although it is possible that significant concentrations of the metals of concern may still be present in thin layer(s) in the soil, this information may have been lost in compositing 4 feet of soil. However, I concur with HWS suggestion that removal and/or treatment of the underlying soils may not be feasible at this time. This is because of the possibility that the inherent alkalinity may have neutralized the acidity and immobilized the mobile metals in the contaminant plume. Final decision on any subsequent action would require information on distribution and leaching extent of metals in the soil. HWS should therefore collect and analyze soil samples from the same profile at 6" to 1' depth increments.

Lockwood plans to continue monitoring ground water. In addition, the concerns I had about their ground water monitoring program (December 20, 1984 memo to Mike from Dave: Comments #1, 2, 5, 6, 7) should be looked into.

DK/thb

HOSKINS-WESTERN-SONDERGER, INC.
ENGINEERS-ARCHITECTS-PLANNERS
124 W. 4TH STREET, P. O. BOX 495
ALLIANCE, NEBRASKA 69301

(308) 762-6262

TO NDEC
200 South Silber
North Platte, NE 69101

Mike St. Copy to Hw
LETTER OF TRANSMITTAL

DATE	Jan 21, 1985	JOB NO.	84-39363987
ATTENTION	Dave Dobscha		
RE:	Lockwood Corp Hazardous Waste Baseline Monitoring		

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

- | | | | | |
|---|---------------------------------------|--------------------------------|----------------------------------|---|
| <input type="checkbox"/> Shop drawings | <input type="checkbox"/> Prints | <input type="checkbox"/> Plans | <input type="checkbox"/> Samples | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Copy of letter | <input type="checkbox"/> Change order | <input type="checkbox"/> _____ | | |

COPIES	DATE	NO.	DESCRIPTION
1			Lockwood corp Paint Spec

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|---|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Resubmit _____ copies for approval |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Reviewed as noted | <input type="checkbox"/> Submit _____ copies for distribution |
| <input type="checkbox"/> As requested | <input type="checkbox"/> Returned for corrections | <input type="checkbox"/> Return _____ corrected prints |
| <input type="checkbox"/> For review and comment | <input type="checkbox"/> _____ | |
| <input type="checkbox"/> FOR BIDS DUE _____ 19 _____ | <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US | |

REMARKS

Dave: Enclosed is the information you requested on the paint Lockwood uses. No residue of this paint should ever reach the acid-dip tank, however. If a painted part needs stripping, it is carried out in a separate self-contained strip tank which is not dumped into the sewer.

COPY TO Roy Dugan

SIGNED: Donald A. Kuklman

MATERIAL SAFETY DATA SHEET

NPCA 1-

FOR COATINGS, RESINS AND RELATED MATERIALS

(Approved by U.S. Department of Labor. Essentially Similar to Form OSHA-20)

DATE PREP 12-2-80

Section I

MANUFACTURER'S NAME Rockford Chemical Coatings, Inc.

REET ADDRESS 1620 Harrison Avenue CITY STATE AND ZIP CODE OF 1825 Avenue H
Rockford, Illinois 61101 St. Louis, Mo. 63125
EMERGENCY TELEPHONE NO 815-962-7768 314-544-3600

PRODUCT CLASS Air Dry

MANUFACTURER'S CODE IDENTIFICATION

11-2-5103

AGE NAME Green Implement Enamel

Section II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV		LEL	VAPOR PRESSURE
		PPM	mg/m ³		
Mineral Spirits	36.0	500		1.0	2.0 mm/Hg @ 20° C.
Ethyl Alcohol	Less than 5.0	1000		4.3	44.0
Cellosolve Acetate	Less than 5.0	100		1.8	2.0
V. M. & P. Naphtha	9.0	500		0.9	15.0 mm/Hg @ 37.77° C.
Lead Chromate	7.0		Pb 0.2 mg/m ³ CrO ₄ 0.1 mg/m ³		

Section III - PHYSICAL DATA

BOILING RANGE 78.33 - 148.98° C. VAPOR DENSITY ☒ HEAVIER ☐ LIGHTER THAN AIR
VISCOSITY RATE ☐ FASTER ☒ SLOWER THAN ETHER PERCENT VOLATILE BY VOLUME 65.0 WEIGHT PER GALLON 8.07

Section IV - FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE CATEGORY Flammable Liquid FLASH POINT Greater than 50° F. LEL 0.9
EXTINGUISHING MEDIA Regular Foam or Carbon Dioxide or Dry Chemical

USUAL FIRE AND EXPLOSION HAZARDS Material is highly volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and cause flash fires or be ignited explosively by pilot lights, other flames, sparks, heaters, smoking, electric motors, or other sources of ignition at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.
FIRE FIGHTING PROCEDURES If contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

HEALTH HAZARD DATA
THRESHOLD LIMIT VALUE: SEE SECTION II

EFFECTS OF OVEREXPOSURE:

EYES - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.
SKIN - PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.
BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLY UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.
SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDRY CONTAMINATED CLOTHING BEFORE RE-USE.
IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY - GET MEDICAL ATTENTION.
IF SWALLOWED: DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.
IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

SECTION VI - REACTIVITY DATA

STABILITY: _____ UNSTABLE _____ X _____ STABLE

INCOMPATIBILITY: AVOID CONTACT WITH: STRONG OXIDIZING AGENTS (E.G. NITRIC ACID, PERMANGANATES, ETC.).

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS: CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.

HAZARDOUS POLYMERIZATION _____ MAY OCCUR X _____ WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILLS - ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.
LARGE SPILLS - ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING. PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL.

WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DESTROY REMAINING MATERIAL BY BURNING IN AN IRON PAN.
LARGE SPILL: DESTROY BY LIQUID INCINERATION.
MATERIAL COLLECTED ON ABSORBENT MATERIAL MAY BE DEPOSITED IN A POSTED TOXIC MATERIAL SUBSTANCE LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: IF TLV OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE PIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE IS ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MESA RESPIRATORS UNDER SPECIFIED CONDITIONS. (SEE YOUR SAFETY EQUIPMENT SUPPLIER).

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS: BUNA-N.

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (SEE YOUR SAFETY EQUIPMENT SUPPLIER).

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING - CONTAINS VOLATILE FLAMMABLE SOLVENTS. USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH SPARKS OR OPEN FLAMES.

OTHER PRECAUTIONS -

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLIDS), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATA SHEET MUST BE OBSERVED. IF THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH ROCKFORD CHEMICAL COATINGS, INC. OR NOT, RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

SPENT MATERIALS / WASTE PRODUCTS SURVEY

McKesson

Please provide all information requested below, then return this form to your local McKesson Chemical Representative.

COMPANY LOCKWOOD CORPORATION				SIC NUMBER 3523					
BILLING ADDRESS P.O. Box 160 Gering, NE 69361				PLANT ADDRESS Highway 92 East Gering, NE 69361					
DESCRIPTION OF SPENT MATERIAL/WASTE PRODUCT Paint Thinner/Solvent				INDICATE PROCESS WHICH GENERATES THIS SPENT/WASTE (BE SPECIFIC) Painting Operations					
VOLUME 500 Gallons				FREQUENCY		PACKING			
				<input checked="" type="checkbox"/> PER MONTH		<input type="checkbox"/> PER YEAR			
				<input type="checkbox"/> ONE TIME		<input checked="" type="checkbox"/> IN DRUMS			
				<input type="checkbox"/> IN BULK					
PHYSICAL PROPERTIES: PHYSICAL STATE AT 70°F MULTI-LAYERED _____ SOLID _____ LIQUID <input checked="" type="checkbox"/> FLASH POINT 240 °C SEMI-SOLID _____ PH 6.4 SPECIFIC GRAVITY 0.888 %CHLORINE _____ % SULFUR _____ BTU PER LB/GAL 16,680				HAZARDOUS PROPERTIES: DESCRIBE— Flammable					
EPA/DOT IDENTIFICATION: EPA HAZARDOUS WASTE NUMBERS F003 F005 EPA HAZARD CODES _____ DOT HAZARDOUS MATERIAL DESCRIPTION Solvent, N.O.S. flammable liquid NA1993									
CHEMICAL COMPOSITION:									
SUBSTANCE		MIN	MAX	TYP	SUBSTANCE		MIN	MAX	TYP
% of solvent				88.8					
% Toluene				5.3					
% Xylene				5.9					
GENERAL: 1. PROVIDE LAB ANALYSIS IF HEAVY METALS, CYANIDES, PESTICIDES, CARCINOGENS, SULFIDES, DIOXINS OR PCB'S ARE INVOLVED. 2. PLEASE DISCUSS ANY OTHER INFORMATION WHICH MAY HELP McKESSON BE OF SERVICE: _____ _____ _____									
PLEASE ATTACH ANY ADDITIONAL HAZARD AND HANDLING INFORMATION TO THIS SHEET.									
TO THE BEST OF MY KNOWLEDGE AND ABILITY TO DETERMINE THIS IS A COMPLETE AND ACCURATE DESCRIPTION OF THIS MATERIAL.									
SIGNATURE Roy R. Dugan					TITLE General Foreman				
PHONE NUMBER (INCLUDE AREA CODE) (308) 436-6327					DATE 9/19/85		EPA IDENTIFICATION NO. NED044101442		

7/16/85

Lackwood Corporation

P.O. Box 160
Highway 92 East, Gering NE 68341

Roy Dugan

Yes ☒ No ☐

Is facility a ☐ Non-notifier; ☒ Notifier

They notified as ☐ Gen; ☐ Trans; ☐ Treat; ☐ Store; ☐ Disp; ☐ SMQ; ☐ NH.

Process description: _____

Name and Address
of Disposition

Other Non-Hazardous Solid Wastes	Place of Disposition

MANIFESTS (CH. 17)

YES

1. Are all manifests properly filled out and signed?
If not, described: _____

☐

2. Are completed copies retained for 3 years?

☒☐

3. Does the facility have the following reports? (CH 18.003)

Annual Report

☒☐

Exception Report

☐☐

Dates _____; _____; N/A;

PERSONNEL TRAINING PLAN (CH 24)

4. Does the owner/operator maintain personnel training records at the facility?

☐☒

A. If yes, do they include job titles, name of employees and job descriptions?

☐☐

5. Name and title of person responsible for training program: Roy Dugan

6. Does every new employee who is involved in handling hazardous waste receive their initial training by six months after beginning new position?

☐☒

7. Is there annual review of training?

☐☒

8. Have they been made aware of the contents of the contingency plan?

☐☒

9. Is training designed to assure effective emergency response?

☐☒

PREPAREDNESS AND PREVENTION (CH. 27)

Required Equipment.

All generator sites shall be equipped with the following, unless it can be demonstrated to the State Fire Marshal that there are no hazards at the facility which could require a particular kind of equipment specified below:

10. Is there an internal communication or alarm system capable of emergency instruction?

☐☐

11. Is there an external communication system (telephone ADT) at the scene of operation?

☐☐

12. Are the following items readily available:

- a. Fire extinguishers?
- b. Fire control equipment?
- c. Foam equipment?
- d. Automatic sprinklers?
- e. Spill control equipment?
- f. Decontamination equipment?

☒☐☒☐☒☐☒☐☒☐☒☐

Yes No

13. Water supply in adequate volume and pressure? ☒ ☐
14. What firm or Agency tests (and/or) maintains the above equipment?

(Name)

(Address)

Protec Systems (Hustings)

Yes No

15. Whenever hazardous waste is handled, all employees shall have immediate access to an internal alarm or through visual or voice contact with another employee, unless the State Fire Marshal has ruled that such a device is not required. ☒ ☐
16. When one employee is on the premises during operation he shall have immediate access to a device capable of summoning external emergency assistance, unless the State Fire Marshal has ruled that such a device is not required. ☐ OK ☐
17. Has the owner/operator made arrangements with the local authorities to familiarized them with characteristics of the facility? (Layout of facility, properties of hazardous waste handled and associated hazards, places where facility personnel would normally be working, entrances to roads inside facility, possible evacuation routes)? ☒ ☐
18. Has the owner/operator arranged to familiarize local hospitals with the properties of hazardous waste handled and types of injuries that could result from fires, explosions, or releases at the facility? ☐ ☐

local nurse with clinic

CONTINGENCY PLAN (CH 28)

19. Is a copy of the Plan readily available on-site? ☒ ☐
20. Has a copy of the Contingency Plan been submitted to DEC? ☐ ☒
21. Have any changes occurred to require submittal of amendments? ☒ ☐

REQUIREMENTS FOR IGNITABLE, REACTIVE OR INCOMPATIBLE WASTE (CH 25)

22. Does facility handle ignitable or reactive wastes? ☒ ☐
23. If yes, is waste separated and confined from sources of ignition or reaction, (open flames, smoking, cutting and welding, hot surfaces, frictional heat) sparks (static, electrical or mechanical), spontaneous ignition and radiant heat? ☒ ☐
24. Are "No Smoking" signs posted in hazardous areas? ☐ ☒
25. Are containers containing ignitable or reactive wastes stored at least 50' from property line? ☐ ☒
26. Do they have an adequate storage area for their hazardous wastes? ☐ ☒

custom galvanizing & Center pivot irrigation

2 1/2 - 3 ft in North Lagoon

10% Subs

80% LCC

but now

12-72 Galvanizing Start

50-50

6" ~~in~~ bentonite

racks

4 years ago closed

NRD bought South Part & moved dike
old lagoon not used since

Sledges mixed with soil for ditch & dike
construction

Zinc - US & Canada

5 drums corrosive material dated 7-11-85

2 Acid tanks @ 4000 gallons
depends on production

25000 gal in ground tank - double backed
for storage of acid prior to USPCI
bailt last June-84

Caustic - Rinse - H_2SO_4 (2) - constant regeneration
in caustic - No waste

32
~~20~~ drums found on July 1 1985 Inventory - most
from satellite areas since Mid April Start-up of new
paint lines Toluene, Xylene, Naphtha & Solvent 150

Mostly 1 shift over 600 employees

HCL - 500 gal - every 3-4 months
mixed with H_2SO_4

* Xylene-Toluene-Naptha-Solvent + 150
Need Quantity + MSDS (Bill)

~~Tip or spray~~ * Phosphating Process prior to painting
to City Sewer 3500 gal to
sewer every 15 weeks
or so

* Paint Sludge - 15-20 drums per mo
to Germ landfill

[Check Bill Gidley for solvent materials]

Training Program
- No Smoking signs - None
Contingency

Capitol Oil get waste oils 50¢/gallons

Started generating solvents - 20 barrels
Big expansion in April

50 ft from Property line - No

Center Pivot

Pipe

Dump Truck Bodies + Hoists

Farm Equipment -

Chains as parts & assemblies

(Paint Sludges - variability -
- need additional tests?)

(Talk to Jay on discharge of test waters)



Hoskins • Western • Sonderegger, Inc.
P.O. Box 80358 825 J Street
Lincoln, Nebraska 68501
402/475-4241

July 17, 1985

RECEIVED

JUL 22 1985

**DEPARTMENT OF
ENVIRONMENTAL CONTROL**

Mr. Roy Dugan
Lockwood Corporation
P.O. Box 160
Gering, Nebraska 69341

Dear Mr. Dugan:

We have reviewed the Nebraska Department of Environmental Control (NDEC) letter dated June 21, 1985. It indicates that the NDEC requires that more data be acquired, including data from an expanded monitor well installation. In summary the NDEC has directed you to: (1) Submit any comments to additional groundwater monitoring locations by July 15, 1985; (2) Submit a groundwater monitoring plan by July 26, 1985; (3) Submit a closure plan by July 26, 1985; (4) Install NDEC recommended monitoring wells by September 15, 1985; and (5) Sample the wells within 60 days of completion.

This letter and appendices can serve as your response to items (1) and (2), above.

Please note that only two documents are indicated as reviewed under K062 regulatory interpretations. These are the Lockwood Hydrogeologic report submitted November 9, 1984 and the Supplemental Report submitted January 7, 1985. No mention is made of the December 19, 1984 Supplemental Report - Hydrogeologic Investigation and Remedial Action Plan Spent Acid Evaporation Pond. Note, however, that the NDEC figure with x's (we believe to be the proposed location of additional monitoring well sites) is taken from this document.

It is apparent the NDEC considers the investigation complete and the data and reports to date all that they will receive. We, however, recommended on November 9, 1984 that four monitoring wells be installed and test pumped and that these wells be used as interceptor wells if dissolved toxic metals were detected (Appendix I) On December 19, 1984 we reiterated these recommendations. (Appendix II). NDEC has not responded to our recommendations to date. To provide an outline of our methods of investigation and our findings, permit us to review our original report our recommendations, and address NDEC's comments. We have attached the original recommendations (Appendices I & II), proposed sites for monitoring/ interceptor wells (Figure 1) and a diagram of an interceptor well (Figure 2).

Methods of Sampling

In the December 19, 1984 Hydrogeologic Investigation HWS we indicated the methods of sampling and testing site soils and waters, the locations and depths. In every case we have attempted to obtain representative samples of the environment in and about the wastewater excursion. To perform representative sampling we used two methods.

1. Sampling of the groundwater from an open boring penetrating the entire saturated thickness of the most permeable unit of the aquifer (Unit 2 - silty gravels and sands).
2. Sampling of specific saturated sediments by split-barrel sampler according to ASTM Designation D 1586-67.

These methods permit detailed field and laboratory inspection of each sample including soil properties as controlled by Unified Soils Classification System, oxidation/reduction characteristics, grain cementation etc. During classification and description samples can be selected for analysis including total metal concentrations and mobile metal concentrations (dissolved in interstitial pore water).

Specifically method 1 permits testing of the groundwater composite of the entire saturated zone. It also permits testing of precipitated metals attached to colloids and/or total metals dissolved in the groundwater. Method 2 permits testing of selected "zones" or intervals of soil by 0.5 to 1.5 feet sampling. This method of sampling also permits testing to distinguish between precipitated and dissolved metals.

These methods of sampling represent a relatively static investigation of site conditions. Because the dissolved toxic metals capable of migrating to a well are a threat to health and the environment, a dynamic investigation is necessary. Monitoring well pump tests (Appendix I-5) are a method of achieving a dynamic investigation. Sampling and testing in such a test is performed under EPA specified procedures.

Pollutant Migration

In the case of spent acid evaporation ponds, the conditions controlling pollutant migration are as follows:

1. Fluid density
2. Fluid pH
3. Intrinsic properties of the aquifer
4. Hydrostatic head
5. Duration of connection of pond to aquifer

There is no doubt that an excursion has occurred at the Lockwood spent acid evaporation ponds; however, your response was timely and cessation of pond use ended the introduction of waste acid fluids into the aquifer. The remaining conditions were analyzed by the initial hydrogeologic investigation.

Our response was a static geologic investigation of subsurface conditions. The investigation proceeded in a logical manner sampling and analyzing soils and groundwater in ever increasing radial distance from the ponds.

Our findings can be summarized as follows:

1. Spent acid liquors containing toxic metals and sulfates and non-toxic metals drained from the evaporation pond through an erosion pit.
2. These waste waters entered an unsaturated soil and fill zone and were distributed beneath the pond.
3. This unsaturated zone drained into a more permeable sandy/silty gravel, aquifer unit (unit-2). All fluids entering site soils and/or fill soils ultimately drain into unit-2.
4. Unit-2 is naturally alkaline and provides a neutralization media for spent acid liquors. All soils and groundwaters are found to be alkaline.
5. Toxic and non-toxic metals occur as cements and precipitates in concentrations above background in unit-2. Their concentration is inversely related to radial separation from the erosion pit. Oxidation conditions were found across the entire area of investigation.
6. We found evidence of an old acid pond bottom soil containing precipitated and oxidized metals stains and cementation of soil particles. We found no evidence of this pit contributing to groundwater contamination.
7. We find no cause for removal of soils underlying the evaporation pond. These soils are non-hazardous containing precipitated toxic and non-toxic metals. No evidence has been found of existing or potential conditions that could result in a return to acidic conditions which could free the toxic and non-toxic metals.

It is our conclusion that the spent acid liquors percolated into site soils and the alkaline groundwaters of aquifer unit 2. The liquors were neutralized and the toxic and non-toxic metals precipitated out of solution. Unless a continuous or repeated quantity of low pH water percolates through these same soils and waters (ie another spent acid pond leak), the metals toxic and non-toxic should remain immobile and pose no threat.

Old Recommendations

The critical recommendations (November 9, 1984) are 1, 4 and 5 in which we recommend closure of the evaporation ponds, installation of four monitoring wells and use of the wells for interception of any migrating toxins and/or pollutants. (Appendix I)

The monitoring well network was designed to surround the evaporation pond site and be capable of use as a retrieval system.

The recommendations of December 19, 1984 are essentially the same as the November 9th recommendations except that chemical analysis of soils beneath the pond subsequent to the November 9th report proved these soils non-hazardous permitting deletion of the recommendation for removal.

To provide a better understanding of the next phase of site investigation that is the dynamic hydrogeologic study we are submitting new recommendations in addition to our November 9, 1984 recommendations.

New Recommendations

The NDEC monitoring well proposal does not meet the criteria for dynamic sampling and aquifer testing. We recommend the following procedures to obtain a hydrodynamic condition for site investigation.

1. Install two of the four proposed 8-inch diameter monitoring/interceptor wells at proposed locations (Figures 1 & 2).
2. Install eight 4-inch diameter monitoring wells at proposed locations. (Use the design proposed on Figure 2 with 4-inch diameter materials in lieu of 8-inch.)
3. Perform an 8- to 24-hour pump test simultaneously on the two 8-inch diameter wells discharging into the neutralization tank. Estimated discharge rate of combined well yields, 50 gpm.
4. Measure drawdown of water levels in all wells under the direction of a hydrogeologist.
5. Sample all monitoring wells prior to, during and after the test under a chain-of-custody procedure and test the samples for total metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, zinc, and iron. Also test for sulfates and sulfides and field test for specific conductance temperature and pH.
6. Sample the pumped interceptor wells at hourly intervals during the test. Field test these water samples for pH, specific conductance and temperature. Sample and analyze water from each well for the above set of metals and sulfate/sulfides during the initial hour and final hour of the pump test. Monitor water levels in each well during the pump test and perform recovery tests on each well. If the concentrations of toxic and non-toxic compounds are below State and Federal drinking water standards and decline in concentration with aquifer stress our conclusion will be substantiated and monitoring rather than restoration should suffice.

7. We recommend encapsulation of the pond with a non-dispersive silty clay cap. The cap should provide from 1.0 to 4.0 feet of cover, drain radially off of the site at not less than a gradient of 0.03 ft/ft from center to approximately 10.0 feet beyond the exterior dike wall. The silty clay cap shall have an in place permeability of not more than 10^{-7} cm/sec measured in place and be seeded with salt tolerate grasses.

Based on the results of this investigation, an appropriate monitoring schedule, set of constituents and parameters of testing can be established or an interception and retrieval plan designed for aquifer restoration.

Response to NDEC Comments

Permit us to address specific NDEC comments. Note however, that most of these comments address concerns we believe are best analyzed by the proposed dynamic aquifer testing.

Pg. 2 (1.) The existence of a silty sand layer beneath the pond add to the distribution of percolating acidic fluids. This is true; however, the higher permeability and the gradient of the groundwater mound created by the leakage result in site drainage into the underlying higher permeability sands and gravels. The ultimate route of off site excursion is unit-2.

Pg. 3 (2.) & (5.) We have already addressed the consistency of sampling and analysis; however, it should be noted that every attempt was made to evaluate the worst case scenario. Digestion of colloids was included in analysis of bailed groundwater to determine the total contamination. It was not the intent of this study to determine dynamic conditions; as recommended this is the purpose of monitoring/interception well pump testing.

Pg. 3 (3.) We were unable to find historic documentation of the prior waste acid pit. Existing metals contamination may or may not be the result of its existence. Our analysis can only be based on fact and existing conditions. Evidence of sub-pond oxidation of iron existed in boring B-3 in the area of reported existence of that pond, no pond currently exists at B-3.

Pg. 3 (4.) We are gratified that NDEC has pointed out our lack of data at boring B-10 on zinc concentrations. This was an unavoidable circumstance resulting from limited soil samples. On site our primary concern was the toxicity and mobility of metals in the aquifer. Note Table 1 of the Hydrogeologic report indicates the groundwater in B-10 contains 0.05 mg/L zinc.

Pg. 3 (6.) We concur with this comment.

Pg. 4 (7.) We concur with this comment although it should be noted that sulfates do occur at relatively high levels naturally in this District and that no evidence was detected of reducing conditions nor of organics in sufficient quantity to induce bacterial degradation.

Pg. 4 (8.) This comment is unclear to us. We are unaware of a standard and would be open to suggestions. It is fundamental to this site that the controlling unit (Unit-2) be examined for analysis of migrating constituents. Every attempt was made to perform this in a static sampling. We have recommended a monitoring plan to test the site dynamically. Simply adding and sampling monitoring wells is insufficient. We concur with the need for monitoring and have proposed additional dynamic testing.

In conclusion we find the NDEC letter report useful in pointing out specific concerns and limits in our communication of our findings. We propose a dynamic test of the aquifer for design of a monitoring program based on our data and NDEC's expressed concerns.

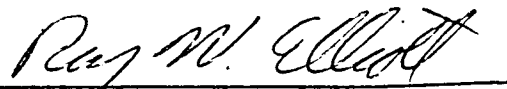
We are concerned that over six months has passed and that as yet we have no response by NDEC to our original recommendations. In accordance with our concerns, we recommend requesting a meeting with Mr. Steffensmeier as soon as possible. It is our hope that our proposed dynamic testing and monitoring well network can have immediate attention and approval to facilitate the study.

If you have any questions, please contact us at your convenience.

Sincerely,

HOSKINS-WESTERN-SONDEREGGER, INC.

By


Roy W. Elliott

RWE/dmk
84-3936-WL15r
cc: Mike Steffensmeier

APPENDIX I

Recommendations by HWS, Inc. November 9, 1984

Our recommendations are as follows:

1. Instigate closure of the spent acid evaporation pond.
2. Remove the pond sediments and clay liner and dispose of in accordance with NDEC regulations*.
3. Cover the site with a silty clay cap not less than 1.0 feet thick and grade to drain away from the site.
4. Install four (4) groundwater monitoring wells fully penetrating to the top of the Brule formation. Sample these wells on a quarterly bases for a minimum of 1 year and test the samples for chromium, lead, sulfate and specific conductance. If at the end of four (4) quarters no increase in these constituents or parameters occurs, reduce monitoring to biannually for two additional years.

Locations for proposed monitoring wells are indicated on Sheet 1. Figure 6 is a general design for proposed monitoring wells.

5. If monitoring reveals continued outward migration of the polluted groundwater, the monitoring wells shall be used as interceptor wells and a pump test performed on each well by hydrogeologist. All waters will be directed to the neutralization tank and treated for subsequent disposal.

*This recommendation is superceeded by recommendation three (3), page 2 Supplemental Report December 19, 1984. See Appendix II this letter.

APPENDIX II

Recommendations by HWS, Inc., December 19, 1985 Supplemental Report, page 2.

1. Instigate closure of the evaporation ponds. Monitor the groundwater as recommended in the Hydrogeologic Investigation and Remedial Action Plan.
2. Encapsulate the abandoned ponds with a silty clay cover with positive, radial drainage.
3. We find no cause for removal of underlying soils and do not recommend treatment or removal.

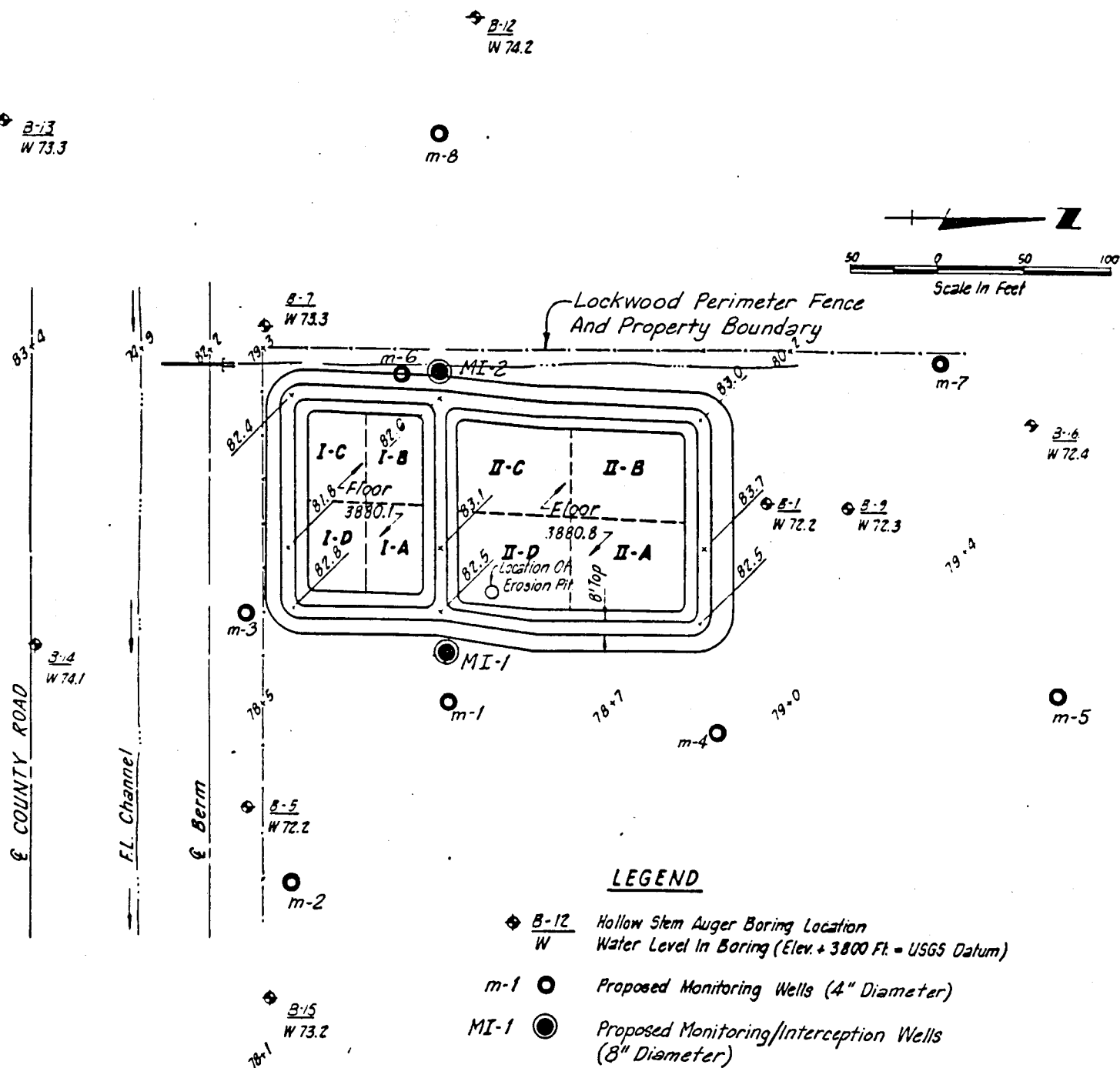
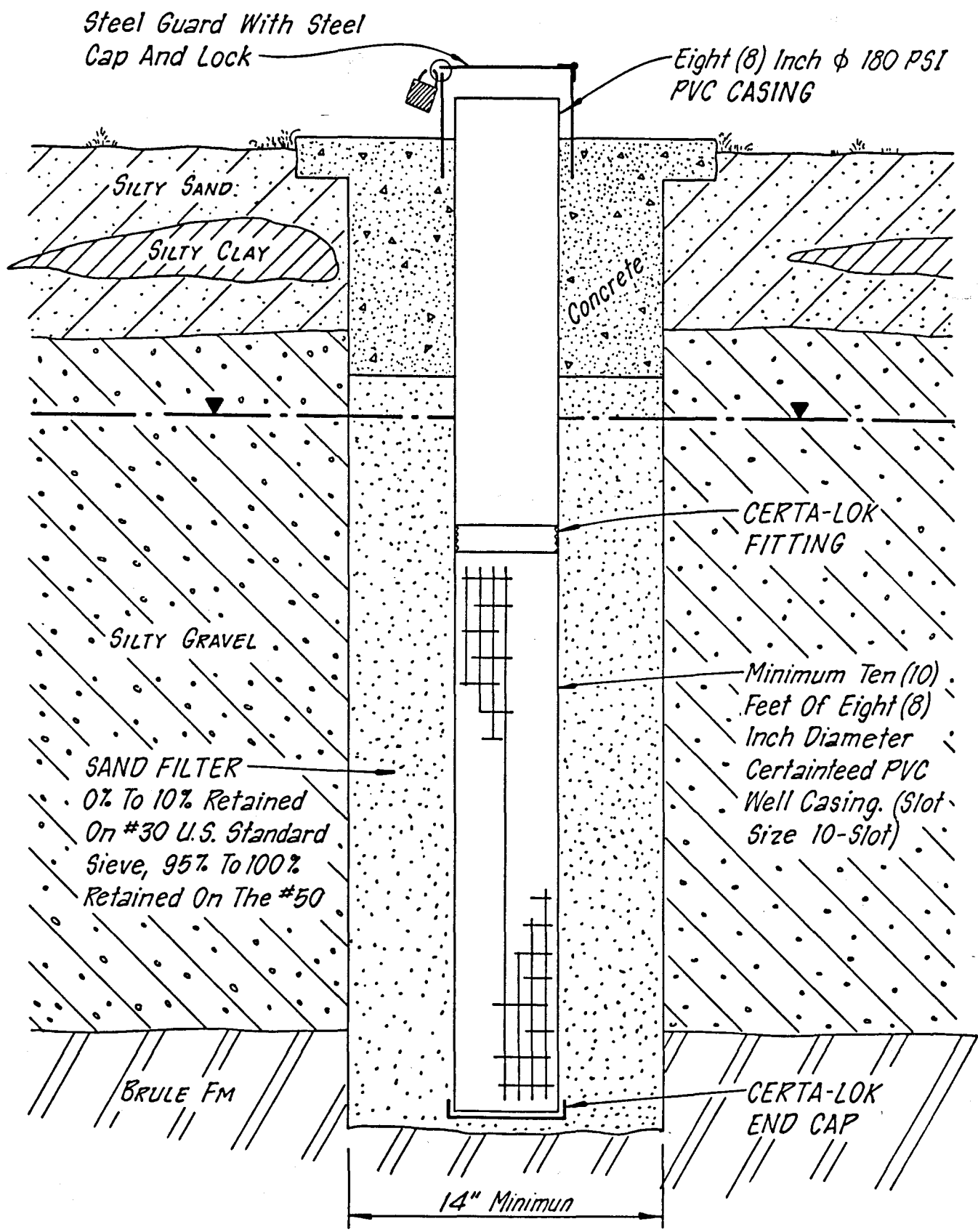


FIGURE 1: PROPOSED LOCATIONS OF MONITORING & INTERCEPTOR WELLS

FIGURE 2 MONITORING / INTERCEPTOR WELL DESIGN



Approval

Div Ch	CH Plans	CH S/A	CH P/E
Deputy	HD Prog/Pl	HD Lab	HD WM
Drafter <i>DS</i>	Data Proc.	HD S/M	HD P/L
Fiscal	Grants	Air	<i>MS</i>
Legal	Engr	Ag	FILE

Coordination

August 20, 1985

Mr. Roy Dugan
Lockwood Corporation
P. O. Box 160
Gering, Nebraska 69341

RE: Groundwater Monitoring
EPA I.D. # NED044101442

Dear Mr. Dugan:

As we discussed, the Nebraska Department of Environmental Control has received and reviewed the proposal for groundwater monitoring locations dated July 17, 1985.

The Department concurs with the ten proposed monitoring locations as identified in Figure 1 and gives approval for well installation at these locations. At this time, the Department recommends that Lockwood not perform the dynamic testing of the aquifer. If subsequent ground water monitoring data warrant this approach, a reconsideration of this proposal will be made by the Department.

If you have any questions or comments, please contact Richard Schlenker of this office at (402) 471-4217.

Sincerely,

MS

Mike Steffensmeier
Section Supervisor
Hazardous Waste Section
Land Quality Division

RS/th

POST CLOSURE PLAN
FOR
LOCKWOOD CORPORATION
WASTE ACID EVAPORATION POND
EPA I.D. NO. NED044101442

RECEIVED

SEP 6 1985

**DEPARTMENT OF
ENVIRONMENTAL CONTROL**

IN ACCORDANCE WITH:

U.S. ENVIRONMENTAL PROTECTION AGENCY
RESOURCE CONSERVATION AND RECOVERY ACT
HAZARDOUS WASTE MANAGEMENT RULES AND REGULATIONS
40 CFR PARTS 264 & 265

AND

NEBRASKA DEPARTMENT OF ENVIRONMENTAL CONTROL
RULES AND REGULATIONS GOVERNING HAZARDOUS WASTE MANAGEMENT

SEPTEMBER 1985

SUBMITTED TO
NEBRASKA DEPARTMENT OF ENVIRONMENTAL CONTROL

PREPARED BY:
HOSKINS-WESTERN-SONDEREGGER, INC.
825 J STREET
LINCOLN, NEBRASKA 68501

POST CLOSURE PLAN

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INTRODUCTION

This post closure plan identifies the groundwater monitoring plan and maintenance activities which will be carried on by Lockwood Corporation at the waste acid evaporation facility after closure during the post-closure care period. The frequency of activities and maintenance procedures are outlined to ensure that the integrity of the cap, and final cover, are maintained in accordance with 40 CFR part 265.

Lockwood Corporation will keep a copy of the post-closure plan and all amendments and records at the plant during the post-closure care period.

I. GROUNDWATER MONITORING PLAN

The proposed groundwater monitoring program will monitor and evaluate the impact, if any, of the closed waste acid evaporation pond (facility) or groundwater quality in the Pleistocene and Recent alluvium overlying the Brule bedrock. At the Lockwood site, these deposits constitute the "uppermost aquifer underlying the facility", as stipulated in 40 CFR, 265.90 Subpart F. The proposed monitoring program will continue through the post-closure care period.

A. Monitoring Wells

The monitoring system will consist of a series of wells surrounding the waste site. Wells will be located hydraulically down-gradient and close to the pit to monitor any potential contamination; some wells will be located hydraulically up-gradient and further from the pit to determine background quality. Wells will be fully penetrating to the top of the Brule bedrock and will be constructed in a manner to allow representative samples of groundwater to be collected.

1. Well Location. The proposed monitoring wells are located as shown in Figure 1 due to the nature of the groundwater flow at the site. As documented in the hydrogeologic investigation, groundwater flows alternately southerly (irrigation season) and northerly (non-irrigation periods). This fluctuating local flow system is due to the presence of unlined irrigation canals and ditches which transmit significant amounts of recharge to the groundwater. Thus, there is no single, well-defined "down-gradient" direction and wells must be strategically

placed around the waste site to properly monitor the area. Six wells intended to detect any contaminant migration are located in close proximity to the facility ("down-gradient" wells MI-1, MI-2, M-1, M-3 M-4, and M-6, see figure 1). Four wells intended to sample background water quality are located further from the facility and are up-gradient, at least seasonally (these "up-gradient" wells include M-2, M-5, M-7, and M-8, see figure 1).

2. Well Construction.

- a. Wells will be constructed according to State guidelines (Nebraska Department of Environmental Control, 1984) and industry standards (EPA/NWWA, 1976). Figure 2 summarizes well construction details. Depth of wells will be 20 to 25 feet to the top of the Brule formation.
- b. Wells MI-1 and MI-2 will be constructed of eight-inch casing and screen and will be capable of being pumped at larger capacities. These wells will be used as interceptor or recovery wells in the event contamination of the groundwater occurs.
- c. All other wells will utilize four-inch diameter casing and screen and will be used solely for monitoring purposes.

3. Well Maintenance. General inspection of the surficial expression of the wells (casing, cap, seal) will be done at each groundwater sampling episode. Well maintenance, repair, or replacement functions will be minimal due to the construction of the wells. Lockwood will repair or replace wells or other

equipment as needed. Wells will be protected at the surface by posts, fencing, and protective outer casing in order to minimize damage to the wells from surface activities.

B. Sampling and Analysis Plan

Samples will be obtained from the groundwater monitoring system on a regular schedule and be stored, transported, and analyzed under accepted scientific procedures and EPA methodology. Monitoring data will be maintained readily available on-site and summarized in a tabular format for easy reference. Transmittal of results to the State and the Regional Administrator will be done in accordance with § 265.94.

1. Monitored Parameters. Analysis of samples will be done performed for the following parameters.

a. EP Toxicity metals and parameters characterizing the suitability of the groundwater for use as a drinking water supply. See Appendix III 40 CFR 265 for a list of parameters.

b. Parameters establishing groundwater quality:

chloride,

iron

manganese

phenols

sodium

sulfate

- c. Parameters used as indicators of groundwater contamination:

pH

specific conductance

total organic carbon

total organic halogen

2. Sampling Frequency.

- a. Initial or background quality will be established by sampling quarterly for one year, with analyses of each sample for all parameters listed above.
- b. For each indicator parameter specified in (c) above, four replicate measurements will be obtained for each sample. Background arithmetic mean and variance will be determined by pooling the replicate measurements from "up-gradient" wells.
- c. After the first year, samples will be collected annually for analysis of parameters listed in Sections (a) and (b) above. Samples will be collected semi-annually for analysis of parameters listed in section (c) above.
- d. If, after two years of monitoring, evaluation of data by methods described in 40 CFR, Part 265.93 indicates no contamination has occurred and results from various wells are consistent, consideration will be given to reducing the frequency of sampling for at least two of the background or "up-gradient" wells, and for one of the wells in each of the "down-gradient" couplets (ie, M-1/MI-1, and M-6/MI-2, see Figure 1).

3. Sampling and Analysis Procedures.

- a. Sampling methodology will be consistent with industry standards and EPA requirements. (Scalf, et al. 1981). Groundwater samples will be collected by submersible pump or inert gas-lift pump, with pump type being consistent at each well over the sampling period. Field determinations of pH and specific conductance will be made. Depth to water in each well will be determined at the time the water quality sample is collected.
- b. Sample preservation will be done in accordance with Standard Methods (APHA, 1980), the National Handbook of Recommended Methods for Water Data Requisition (USGS, 1984) and currently published EPA laboratory methodology.
- c. Samples will be shipped to a commercial laboratory by commercial transportation and arrive at the laboratory within 30 hours of collection. Lockwood will maintain chain of custody by completing the attached Hazardous Waste Analysis and Chain of Custody Sheet for all samples.
- d. Analyses will be performed according to the references cited above and as per 40 CFR Part 265 regulations.
- e. Evaluation of the data and owner/operator response will be done in accordance with 40 CFR Part 265.93. This analysis will determine if statistically significant increases (or decreases, in the case of pH) in concentration of water quality parameters have occurred. If statistically significant increases are determined, NDEC will be noti-

fied and remedial response as outlined in 40 CFR Part 265.93 will be implemented to contain or remove the contamination upon approval of NDEC.

C. Records

Copies of all groundwater monitoring activities and maintenance performed during the post-closure period will be kept with the post-closure plan at the Lockwood Corporation Plant, site of the facility.

II. MAINTENANCE ACTIVITIES

A. Facility Inspections

Annual and routine periodic inspections of the facility final cover, security fencing, and groundwater monitoring system will be conducted to ensure that each item remains functionally reliable throughout the post-closure care period.

B. Maintenance

Post closure maintenance of the closed waste acid evaporation pit and monitoring wells system will be minimal. The facility's gentle surface slopes and final gravel stabilization cover minimize erosion and will require very little maintenance. All surfaces are graded to drain to the plant's stormwater surface drainage. Routine maintenance will be conducted according to usual plant maintenance policies to ensure that drainage is maintained and surface water pooling and erosion is prevented. Written record copies of all inspections and maintenance activities performed during the post closure care period will be kept with the post-closure plan at Lockwood Corporation.

The following lists the address and phone number for contacting Lockwood about the facility during the care period:

Lockwood Corporation
Post Office Box 160
Gering, Nebraska 69341
Phone: (308) 436-5051

Approval	Div. Co. _____	CH Plans _____	CH S/A _____	CH P/M _____
	Deputy _____	ED Prog/Pl _____	ED Lab _____	ED RM _____
	Draftsman <i>RS</i> _____	Data Proc. _____	ED S/M _____	ED P/A _____
Coordination	Fiscal _____	Spans _____	Air _____	<i>MS</i>
	Legal _____	Engr _____	Ag _____	File _____

June 21, 1985

Mr. Roy Dugan
Lockwood Corporation
P. O. Box 160
Gering, Nebraska 69341

RE: K062 Surface Impoundment

Dear Mr. Dugan:

The Department of Environmental Control has reviewed the Lockwood hydrogeologic report submitted November 9, 1984 and the Supplemental Report submitted January 7, 1985. These reports have been reviewed using the K052 regulatory interpretations which were discussed during the meetings with Nebraska galvanizers during March 1985.

The review comments are organized in the following manner. A summary listing of the review is given, followed by the Department recommendations. Finally, technical review comments to the submitted reports are listed.

Generally the reports contained a useful compilation of hydrogeologic information and site-specific soil testing and analysis data. However, the interpretation of the data by the Department reached different conclusions from that presented in the Lockwood reports.

1. The Department's interpretation of the data presented is that there exists a potential for continuing contamination from the waste constituents, either from a leak of the current surface impoundment or from past practices.
2. The Department may agree that metals that have been immobilized in the soil would not pose a threat to the groundwater. However, at this time, there is insufficient data to document that there is not continued migration.
3. The Department found little supporting data for the proposed monitoring well locations. Our interpretation of the available hydrologic and geologic data indicates that a more extensive monitoring well network is necessary.
4. The Department has developed a recommended monitoring well network. This network is described in more detail in the subsequent paragraphs.

Mr. Roy Dugan
Page 2
June 21, 1985

5. The Department believes that there is now adequate data and regulatory clarification regarding K052 for Lockwood to prepare a closure and post-closure plan for the surface impoundment. Please submit your plan to the Department by July 26, 1985.

The Department has reviewed the available data regarding the contamination that exists in the ground and groundwater at the surface impoundment site. Although there have been preliminary information collected that demonstrate contamination, the proposed groundwater monitoring system is the minimum detection system for an uncontaminated site.

Therefore the Department recommends that a more comprehensive system be established for monitoring and assessing the groundwater and contamination. The Department has prepared a description of suggested monitoring locations. A map reproduced from the hydro-geologic report shows the Department's recommended monitoring well locations. Of course, further development of the system may be necessary if subsequent data show that migration of contamination is occurring or that there remains an undefined extent of contamination. We welcome your comments in this regard.

The Department requests that Lockwood provide any comments to the groundwater monitoring locations by July 15, 1985. Also, the Department requests that installation of the groundwater monitoring system be completed by September 15, 1985 and that sampling be completed within sixty (60) days after construction. Also, please prepare and submit a groundwater monitoring plan to the Department by July 26, 1985.

The Department's technical review comments of the submitted reports are listed below. These comments also form a substantial portion of our rationale for the suggestions in the summary.

1. An analysis of the boring logs indicates that there exists a silty sand layer that extends at least under the southeast portion of the surface impoundment near location B3 and B4. This layer may also extend in an eastward direction because of the silty sandy layer found in B10. Therefore, the areal extent of the clay layer under the surface impoundments is uncertain and a pathway for contaminant migration may exist.

Mr. Roy Dugan
Page 3
June 21, 1985

2. The data presented in the reports were from samples collected at several different times and various analyses were performed on these samples. Since consistent sampling and analysis was not done, interpretation of the extent of contamination was more difficult. Also it appeared that some conclusions reported were based upon inconsistent data. For example, the November 9 report, finding 6, asserts that the chromium content in the groundwater decreases southerly from B3-B14. This may be a questionable conclusion because a total chromium concentration of 0.35 mg/l is compared to a dissolved chromium content of 0.13 mg/l.
3. Although a footnote mentions a prior waste acid pit, no discussion or analysis is presented to document the impact that this pit may have had upon the current data findings. Location B-3 which shows contamination was stated to be in the area of the old pit.
4. Although B-3 and B-10 both exhibit elevated specific conductivity, sulfate concentration and iron concentration and B-3 exhibits elevated leachable zinc, (1200 mg/l) B-10 had no report of leachable zinc.
5. It was inferred that field filtering prior to dissolved metal analysis was not performed. High sediment samples may influence concentration changes caused by sorption and/or desorption that may result in less accurate analysis results. Field filtering is the preferred and recommended procedure for water samples containing sediment.
6. It is anticipated that additional data regarding the groundwater elevation will need to be collected because the limited data available is not sufficient to establish the direction and amount of groundwater flow. As discussed on page 7 of the Hydrogeologic Report, the groundwater flow may be complex. Plume delineation and prediction of migration is dependent upon collection of adequate data.

Mr. Roy Dugan
Page 4
June 21, 1985

7. High concentrations of sulfates were found in the groundwater. Although the pH of the groundwater is high due to the presence of carbonates, the high sulfates may pose a problem if the sulfates are reduced to sulfides. Reductions of sulfates to sulfides may take place in waters of high COD or high BOD, indicating anaerobic conditions. Neither the reducing status (as TOC) nor the sulfide concentrations of the groundwater was determined. Since the concentrations found exceed the recommended drinking water quality standard (250 ppm) a sulfate plume would cause an adverse impact upon a drinking well.
8. The vertical distribution of the concentration was not clear because the sampling consisted of composites from up to 4 foot intervals. Although this information provides a rough indication of the concentration profile in the soil, it is not a clear indication of the presence or absence of migration of constituents.

In conclusion, the Department finds that Lockwood needs to develop a monitoring and assessment system for groundwater monitoring near the surface impoundments. Lockwood also needs to prepare a groundwater monitoring plan and a closure and post-closure plan for the surface impoundment.

If you have any questions or comments, please contact Richard Schlenker of this office at (402) 471-4217.

Sincerely,

MS
Mike Steffensmeier
Section Supervisor
Hazardous Waste Section
Land Quality Division

RS/thb

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: Sept. 16, 1985

REPORT NO.: 85440
(Preliminary)

FOR: Lockwood Salvage Yard
Gering Industrial Site
P. O. Box 160
Gering, Nebraska 69341

ATTN: Roy Dugan

JOB NUMBER: 85/2005

DATE RECEIVED: 8-8-85

CLIENT/FIELD IDENTIFICATION: Collector's I.D.: W-011
Barrels (F-001 - F-020); (F-022 - F-024);
(F-034 - F-040)
Solvent/Paint Thinner

LABORATORY IDENTIFICATION NO.: 19500

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
pH	S.U.	6.4		SD
Flash Point	°C	24	337-55	WI
Metals, E.P. Toxicity				
Arsenic	mg/L			
Barium	mg/L			
Cadmium	mg/L	< 0.005	85-1/259	SD
Chromium	mg/L			
Lead	mg/L	5.40	85-1/255	SD
Mercury	mg/L			
Selenium	mg/L			
Silver	mg/L	2.75	85-1/262	SD
Specific Gravity		0.888		SD
BTU Value	BTU/pound	16,680		OT
% of Solvent	% by Weight	88.8	509-63	WI
(Hydrocarbon Scan)				
Toluene	% by Weight	5.3	509-63	WI
Xylene	% by Weight	5.9	509-63	WI
Methyl Ethyl Ketone	% by Weight	< 0.1	509-63	WI

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, The Federal Register, Vol. 49, No. 209, Oct. 26, 1984 (43251-43258), and ASTM D-93.

By

JR Smith

**QUARTERLY REPORT
GENERATORS OF
CONTROLLED INDUSTRIAL WASTE**

To be completed by generators of controlled industrial waste as defined by 63 O.S. 1981, § 1-2004 et seq., and rules and regulations promulgated pursuant thereto, on a quarterly basis. This report is to be received by the Oklahoma State Department of Health, Industrial Waste Division, no later than thirty (30) days after the end of the quarter.

Business/Plant Name: Lockwood Corporation Phone No. (308) 436-5051

Mailing Address P. O. Box 160 City Gering State NE Zip 69341

Plant Address/Location Highway 92 East City Gering County Scotts State NE
Norman H. Holton, V. B. Manufacturing Bluff

Authorized Agent and Title Norman H. Walton, V. P. Manufacturing Bluff

Type or print clearly. Group entries by receiver, or use separate sheets for each.

Page No. 1 of 1

① ② ③ ④ ⑤ ⑥ ⑦

[illegible]

ter One: (1) Gallons (2) Pounds (3) Tons (4) Drums (55 gal.) (5) Cubic Yards
 2 short descriptions where possible, i.e., "neutralization, then lagoon" or "lagoon, then injected" or "volume reduction, then incinera-
 on," or "into storage 5-11-84," etc.

I hereby certify that the above record is accurate and correct to the best of my knowledge, and includes all controlled industrial wastes generated by this facility, for the quarter ending June 30, 1985.

Date _____

Signature of Authorized Agent

WESTERN LABORATORIES
ANALYTICAL SERVICES

Telephone (402) 475-4241

825 J Street P.O. Box 80358 Lincoln, Nebraska 68501

DATE: October 21, 1985
REPORT NO.: 85440 (FINAL)
INVOICE NO.: 23259

FOR: Lockwood Salvage Yard
Gering Industrial Site
P. O. Box 160
Gering, Nebraska 69341
ATTN: Roy Dugan

JOB NUMBER: 85/2005

DATE RECEIVED: 8-8-85

CLIENT/FIELD IDENTIFICATION: Collector's I.D.: (W-011)
Barrels (F-001 - F-020); (F-002 - F-024);
(F-034 - F-040)
Solvent/Paint Thinner

LABORATORY IDENTIFICATION NO.: 19500

Analysis	Units	Concentration	Book/Page	Analyst
Physical Properties				
pH	S.U.	6.4		SD
Flash Point	°C	24	337-55	WI
Metals, E.P. Toxicity				
Arsenic	mg/L	0.775	85-1/276	WV
Barium	mg/L	1.0	85-1/266	SD
Cadmium	mg/L	<0.005	85-1/259	SD
Chromium	mg/L	2.25	85-1/264	SD
Lead	mg/L	5.40	85-1/255	SD
Mercury	mg/L	<0.005	85-1/270	SD
Selenium	mg/L	<0.25	85-1/276	SD
Silver	mg/L	2.75	85-1/262	SD
Specific Gravity		0.888 gm/ml		SD
BTU Value	BTU/pound	16,680		OT
% of Solvent (Hydrocarbon Scan)	% by weight	88.8	509-63	WI
Toluene	% by weight	5.3	509-63	WI
Xylene	% by weight	5.9	509-63	WI
Methyl Ethyl Ketone	% by weight	<0.1	509-63	WI

Analyses were performed in accordance with EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes, The Federal Register, Vol. 49, No. 209, Oct. 26, 1984 (43251-43258), and ASTM D-93.

By

Al Smith

October 3, 1985

Roy Dugan
Lockwood Corporation
P.O. Box 160
Gering, NE 69341

Re: Interim Status Ground Water Monitoring

Dear Mr. Dugan:

The Department has received your submittal dated September 6, concerning the closure and post-closure plans. Comments were prepared regarding the ground water monitoring plan and are detailed in this letter. A technical review of the closure and post-closure will be performed and comments prepared at a later date.

The monitoring well construction methods appear adequate. Please note, however, that specific grain sizing documentation for the filter pack is requested, and may be submitted with the well construction logs.

The Department recommends that the first groundwater sampling be performed within 60 days after installation. Of course, earlier sampling may be performed. The sampling results are due to the NDEC within 30 days after sampling.

The Department has reviewed your proposal concerning the analytical parameters for the groundwater monitoring. The following parameters will be required, at least initially, to assess the ground water quality at Lockwood.

pH	Chloride	Sulfate
Specific Conductance	Iron	Zinc
Total Organic Carbon	Manganese	Lead
Total Organic Halogen	Phenols	Chromium
	Sodium	Cadmium

Please note that the metals parameters are total metals rather than E.P. toxicity analysis.

In addition, soil samples from the borings should be tested for pH, zinc, chromium, lead and sulfate with a soil sample aliquot retained for further analysis if necessary.

The NDEC believes that a single set of groundwater analyses is an insufficient set of data for interpretation. Therefore, to facilitate data collection, monthly sampling of all groundwater monitoring wells will be required for at least four months. After that period, Lockwood and NDEC will review the data and adjust the monitoring frequency accordingly. Also, it is requested that analysis for the metals be performed on both filtered and unfiltered groundwater samples for at least two of the first four sampling intervals.

Roy Dugan
October 3, 1985
Page 2

In conclusion, groundwater elevation data should be collected on a monthly basis to clarify the potential shifts in the groundwater gradients.

If you have any questions or comments, please contact Richard Schlenker of this office at (402) 471-4217.

Sincerely,

MS

Mike Steffensmeier, Supervisor
Land Quality Division
Hazardous Waste Section

/RS/ds

Memorandum

TO: Mike Steffensmeier *MS*
FROM: Robert J. Tobin *RJT*
DATE: October 31, 1985
RE: Observation of Monitor Well Equipment - Lockwood Corporation
October 8 - 10

At approximately 0830, October 7, I contacted Mr. Roy Dugan of Lockwood Corporation who informed me that drilling would commence shortly on the proposed 10-well drilling round.

I arrived on site at 0730, October 8, finding a standard 2000 ft. certified truck-mounted rotary rig with water and service trucks. The service trucks contained approximately 40' of 6" and 160' of 4" I.D. Schedule 40 "NSF Pro" PVC casing, 20' of 6" and 80' of 4" ID Schedule 40 "NSF Pro" PVC factory-slotted, louvered 10/1000" screen. Pull plugs were sonic-welded on the 6"; all joints were "certain-teed" (with flat threads and "O" rings). No pipe dope, PVC primer or PVC solvent cement were present. No bow spring or broad-fin bull plug centralizers were present. Gravel pack material was stockpiled in a truck bed - a very well sorted, medium grained fluvial sand, sub-rounded, approximately 85% Qtz, 10% alkali feldspar, 5% mafics. The trucks also contained sacks of cement and "Poly Gel" (a drilling mud containing sodium bentonite and a strong caustic commonly used in shallow, unconsolidated formation oil wells; it produces a thick borehole mud cake).

The presence of a rotary rig and "poly gel" were causes for concern. NDEC had specified in previous correspondence that soil (sic) samples be taken during drilling. This implies the use of an auger, which yields chemically undisturbed samples. The addition of drilling mud, particularly a caustic mud, increases pH and also adsorbs metal cations; low pH and high heavy metals concentration are the anticipated measureable effects of KO62 contamination. In short, the method employed on well emplacement would tend to invalidate the chemical monitoring results.

The crew and HWS consultant representative (Don Kuhlman, P.E.) arrived at 0920. I expressed my concerns to him and he indicated that of the two wells drilled on October 7, the 4" I.D. well was drilled using fresh water and the 6" I.D. well was drilled using "poly gel". I informed him that the chemical results from the 6" I.D. well would have to be considered suspect and that later review of this data by NDEC may result in a request for redrilling. I recommended use of fresh water from this point on and sodium bentonite only if borehole sloughing prevented completion. I also indicated that hollow-stem augering would have been a superior installation technique as it would not have required the bentonite contingency.

Kuhlman called his "poly gel" supplier who concurred with my recommendation. Drilling proceeded using fresh water on two wells at which

MEMO

Page 2

October 31, 1985

point it was apparent that formation sloughing compromised reservoir continuity adjacent to the wells. Having acquired a supply of sodium bentonite, drilling on the 9th and 10th proceeded without problems; the final monitoring well was completed by 1900, October 10.

HWS consultant had made no provision for decontamination of drilling equipment or submersible development pump between wells, nor was there any well site monitoring for volatile organics. The gravel pack was shoveled into place without use of funnel and tremie pipe to protect the purity of the pack from up hole formation sloughing. Cement was poured directly on the gravel pack. Casing lengths from T.D. to final sawed top were recorded only at my insistence. There was no engineering rationale for development pumping rate or duration. Drillers were unsupervised by the HWS consultant 30-40% of the duration of drilling. The drillers were not informed of the identity, toxicological effect, or symptoms of the suspected contaminant. Personnel safety considerations were inadequate: chemically protective gloves, coveralls, and safety goggles were not used. Cutting samples were taken using bare hands. Kuhlman was apparently unaware of O.S.H.A. drilling safety requirements with respect to steel-toed shoes and hard hats.

As I had requested previously, HWS had histograms of formation boring samples and the proposed gravel pack material on site. Evaluating these according to the procedures of 1) U.S. Department of Interior Ground Water Manual and 2) Johnson Division U.O.P. Groundwater and Wells, it was apparent that the engineering design of gravel pack grain size parameters and screen slot size was sound.

cd

Failure to comply with the above mentioned tasks may result in appropriate enforcement actions against Lockwood.

Roy Dugan

2

February 21, 1986

If you have any questions concerning this, please contact Rich Schlenker of our office at (402) 471-4217.

Sincerely,



Mike Steffensmeier
Section Supervisor
Hazardous Waste Section
Land Quality Division

RS/th

(1) EPA ID: NED044101442 (2) Date 3-10-86 (6A) Gov't Facility ☐ F,S,L (7) EPA Completes this block ☐ GWM ☐ SNC ☐

(4) No EPA ID ☐ (8) Facility Type ☐ TSN ☒ Transporter ☐ Generator ☐ only ☐ Sm. Quantity Generator (less than 100 kg)

(5) HANDLER NAME: Lockwood Corp

(6) ADDRESS: Gering Nebraska
City and State

(9) DATE OF INITIAL EVALUATION WHICH IS THE BASIS FOR THIS REPORT 2/2/86 (10) AGENCY RESPONSIBLE FOR EVALUATION: F = EPA S = State O = Other R = Contractor/State
Put code in box 5 C = Contractor/EPA
Choose One

(11) TYPE OF EVALUATION COVERED BY THIS REPORT: 3
Put code in box
Choose one

1 = Evaluation Inspection 6 = Other - Citizen Complaint
2 = Sampling Inspection 7 = Other - Part B Call-In
3 = Record Review 8 = Other - Withdrawal Candidate
4 = Groundwater Monitoring Evaluation 9 = Other - Closed Facility
5 = Follow Up 10 = Other - *

(12) DATE OF EVALUATION COVERED BY THIS REPORT (enter only if different from Block 9): 1/1/86 Update

(13) AREA AND CLASS OF VIOLATION (enter 'X' in appropriate box(es) if violations found. Enter '0' if no violations found in Area(s) evaluated)	Class of Violation	Area of Violation						
		GWM	CL/PC	Fin.Res	Pt. R	Cmpl. Sch	Manifest	Other*
I		2	0	0				
II		2	0	0				

(14) ENFORCEMENT ACTIONS

Class	Area of Violation	Type (use code)	Date of Determination	Date Action Taken	Compliance Scheduled	Dates Actual	Penalty Assessed	Collected	Resp. Ag. (use code)
I	GWM	03	2-21-86	2-21-86	3-7-86	3-7-86	-	-	S

Codes for Types of Enforcement Actions:

03 = Warning letter
05 = Administrative Order
10 = Informal

11 = Filed Civil Action

12 = Filed Criminal Action

14 = Referral to EPA (Violations referred by a state to EPA for action)

15 = §3008(h) Final Order

Codes of Responsible Agency:

E = EPA

S = State

(15) STATUS OF HANDLER WITH COMPLIANCE SCHEDULE OF ORDERS: Meeting compliance schedule YES ☒ NO ☐ STATUS DATE 3/10/86(16) Comments: Closure plan review plus warning letter regarding ground water monitoring

(Limit each comment to 80 characters. Up to 99 comments are possible.)

* Specify type of evaluation or area of violation in comment field.

(1) EPA ID: WED104411011442 (2) Date 6-30-86 (3) Name of Preparer R. Nyffeler

(4) No EPA ID ☐ (5) HANDLER NAME: Lockwood Corporation

(6) ADDRESS: P.O. Box 160 Gering NE 69341
City and State

(6A) Gov't Facility ☐ F, S, L (7) EPA Completes this block
GWM ☐ SNC ☐

(8) Facility Type
TSN ☐ Sm. Quantity Generator (less than 100 kg)
Transporter ☐ Generator ☒ only

(9) DATE OF INITIAL EVALUATION WHICH IS THE BASIS FOR THIS REPORT 6/2/86 (10) AGENCY RESPONSIBLE FOR EVALUATION:
Put code in box 5 Choose One
E = EPA S = State C = Contractor/EPA
O = Other R = Contractor/State

(11) TYPE OF EVALUATION COVERED BY THIS REPORT: 7
Put code in box Choose one
1 = Evaluation Inspection 2 = Sampling Inspection 3 = Record Review 4 = Groundwater Monitoring Evaluation 5 = Follow Up
6 = Other - Citizen Complaint 7 = Other - Part B Call-In 8 = Other - Withdrawal Candidate 9 = Other - Closed Facility 10 = Other - *

(12) DATE OF EVALUATION COVERED BY THIS REPORT (enter only if different from Block 9): / / Update

(13) AREA AND CLASS OF VIOLATION (enter 'X' in appropriate box(es) if violations found. Enter '0' if no violations found in Area(s) evaluated)

Class of Violation	Area of Violation						
	GWM	CL/PC	Fin. Res	Pt. B	Cmpl. Sch	Manifest	Other*
I						X	X
II							X

(14) ENFORCEMENT ACTIONS

Class	Area of Violation	Type (use code)	Date of Determination	Date Action Taken	Compliance Dates		Penalty		Resp. Ag. (use code)
					Scheduled	Actual	Assessed	Collected	
<u>I</u>	<u>manifests 90-day storage</u>	<u>03</u>	<u>6-2-86</u>	<u>6-30-86</u>	<u>8-4-86</u>				

Codes for Types of Enforcement Actions: 03 = Warning letter 05 = Administrative Order 10 = Informal 11 = Filed Civil Action 12 = Filed Criminal Action 14 = Referral to EPA (Violations referred by a state to EPA for action) 15 = §3008(h) Final Order

Codes of Responsible Agency: E = EPA S = State

(15) STATUS OF HANDLER WITH COMPLIANCE SCHEDULE OF ORDERS: Meeting compliance schedule YES ☐ NO ☐ STATUS DATE / /

(16) Comments: Exceeding 90-day storage and manifest violations

(Limit each comment to 80 characters. Up to 99 comments are possible.)

* Specify type of evaluation or area of violation in comment field.

APPROVAL:

DIRECTOR _____	TSS SUPV _____	LQ CH _____	WQ CH _____	DRAFTER <u>RN</u>
ASST DIR _____	LSS SUPV _____	AG SUPV _____	P&C SUPV _____	PIO _____
AQ CH _____	PCS SUPV _____	EW SUPV <u>MS</u>	W&F SUPV _____	OTHER _____
SS CH _____	LA3 SUPV _____	W/R SUPV _____	WPA SUPV _____	_____

June 30, 1986

Lockwood Corporation
P. O. Box 160
Gering, Nebraska 69341

ATTN: Mr. Roy Dugan

RE: Hazardous Waste Compliance Inspection
EPA ID# NED044101442

Dear Mr. Dugan:

Enclosed is a copy of a RCRA compliance inspection of the above referenced facility on June 2, 1986.

The results of this inspection have identified several areas of non-compliance. The violations and associated regulatory citations (Title 128 - Rules and Regulations Governing Hazardous Waste Management in Nebraska) are as follows:

1. Failure to properly fill out uniform hazardous waste manifest (Title 128 - Chapter 17, 001).
2. Failure to submit an Exception Report to the Department (Title 128 - Chapter 18, 003.02B).
3. Failure to keep containers holding hazardous waste closed (Title 128 - Chapter 19, 004.01A2).
4. Failure to manage the satellite storage area so as not to accumulate more than 55 gallons of a hazardous waste in that area, and failure to date and remove the excess after three days (Title 128 - Chapter 19, 004.05).
5. Failure to maintain adequate aisle space in the hazardous waste storage area (Title 128 - Chapter 27, 006).
6. Failure to familiarize local hospitals with the properties of hazardous wastes handled (Title 128 - Chapter 17, 007.01D).
7. Storing hazardous waste for longer than 90 days without a permit as a Treatment, Storage and Disposal Facility (Title 128 - Chapter 19, 004.02).

Lockwood Corporation
Page 2
June 30, 1986

8. Failure to develop a Personnel Training Plan (Title 128 - Chapter 24).

These violations are to be corrected by August 4, 1986. Meanwhile please send a written response describing how your company intends to address these violations.

If you have any questions please contact Russ Nyffeler of my staff at (402) 471-4217.

Sincerely,



Mike Steffensmeier
Section Supervisor
Hazardous Waste Section
Land Quality Division

RN/thb
Enclosures

cc: Mike Sanderson, U. S. EPA-Region VII
(W/ENCL.)

NEBRASKA DEPARTMENT OF ENVIRONMENTAL CONTROL
HAZARDOUS WASTE MANAGEMENT SECTION
RCRA COMPLIANCE INSPECTION

LOCKWOOD CORPORATION
P. O. BOX 160
GERING, NEBRASKA 69341

EPA ID# NFD044101442
INSPECTED JUNE 2, 1986

Participants

Lockwood Corporation

Roy R. Dugan	-	General Foreman
Bob Knowles	-	Galvanizing Foreman
Larry Johnson	-	Industrial Engineer

DEC

Russ Nyffeler	-	Environmental Specialist
---------------	---	--------------------------

Introduction

This inspection was conducted pursuant to Neb. Rev. Stat. §81-1505(30)(A), to determine whether Lockwood Corporation is in compliance with Title 128 - Rules and Regulations Governing Hazardous Waste Management in Nebraska, established under the Resource Conservation and Recovery Act (RCRA) of 1976 as amended.

On arrival at Lockwood Corporation I met with Mr. Roy Dugan who was my principle contact throughout the inspection. After explaining the purpose and nature of my inspection, Mr. Dugan discussed the manufacturing process and the wastes generated. During the inspection we reviewed pertinent documents and toured the facility. We were joined in the inspection at different times by Mr. Bob Knowles, Galvanizing Foreman and Larry Johnson, Industrial Engineer.

Lockwood Corporation is a full quantity generator of hazardous waste. Mr. Dugan was notified of the inspection on May 29, 1986.

Process Description

Within the last couple of years Lockwood Corporation has acquired Perfection-Cobey Company formerly based in Gallion, Ohio, and has moved the operation to Gering. With this move, the majority of Lockwood's production

now involves the manufacturing of dump truck body hoists, pumps, hydraulic cylinders and truck bodies. Lockwood continues to manufacture center pivot irrigation systems, potato harvesters and potato planters. Manufacturing processes include: machining, forging, welding, galvanizing, fabrication, phosphatizing, painting and assembly.

Waste Streams

1. Spent Pickle Liquor (K062/D002). This waste is generated from the sulfuric acid - hydrochloric acid pickle liquor station of the hot dip zinc galvanizing operation. When the acid can no longer be used, one or both of the approximately 5,000 gallon tanks are pumped to a 40,000 gallon waste acid holding tank (picture attached) to await transportation to Gibraltar Chemical Resources, Inc. in Winona, Texas (TSD000742304) for disposal.
2. Waste Acid Sludge (K062/D002). This waste is generated from the cleaning out of the waste galvanizing acid tank, generating approximately 150 drums (pictures attached). Since April of this year 125 drums have been filled.

Once cleaning is completed this waste is shipped to U. S. Pollution Control in Oklahoma (OKD06543876).
3. Waste Caustic Sludges (D002). This waste is generated from the cleaning of the caustic tank of the galvanizing operation. Only 4-5 drums of waste caustic sludge is generated a year. This waste also goes to U. S. Pollution Control.
4. Waste Petroleum Naphtha (D001). This waste is generated from several small parts washers located throughout the facility. The solvent is supplied by and picked up by Safety Kleen Corporation out of Gering, Nebraska (NED000687178). Lockwood generates approximately 1700 lbs of this waste per month.
5. Waste MEK, Xylene, Toluene Solvents (F003/F005). This material is used as a paint thinner and as a paint line equipment cleaner. The waste is accumulated in 55-gallon drums outside of the painting area. It is transported by Nebraska Solvents to Oil and Solvent Process Company (OSCO) of Henderson, Colorado.
6. Waste Paint Sludges (F003/F005/D001). This waste is generated from the two paint lines. It is accumulated in 55-gallon drums outside the main building (see pictures). This waste is transported by Nebraska Solvents and Watts Trucking to LWD, Inc. in Calvert City, Kentucky.
7. Waste Paint Filters. This waste is generated from the paint booths used to paint the manufactured truck bodies. The waste filters are collected in 55-gallon drums containing water and disposed of at the local landfill.

8. Phosphating Waste Water. This waste is generated from the immersion of steel truck body parts in a diluted solution of phosphoric acid and other reagents to condition the surfaces for painting. About 3500 gallons of this waste goes to the sewer every 15 weeks or so.

Observations and Compliance Determinations

1. At the time of this inspection, both surface lagoons, that were originally used to hold the spent pickle liquor, were empty except for the dried bottom sludge. June 26, 1984 was stated as the last date any waste liquid was discharged to the lagoons. On June 28, 1984 the first shipment of K062 was sent off-site for disposal.

Ten monitoring wells were observed around the lagoons.

2. In reviewing Lockwood's uniform hazardous waste manifests, several discrepancies were noted:
 - a. Lockwood failed to write in the correct generator's U. S. EPA ID# on manifests #00056 and #65197069 (Attachments #2 and #11).
 - b. Lockwood failed to write in the date when the original manifest was signed on manifests #00062 and #7373127069 (Attachments #3 and #8).

All applicable sections of each manifest shall be completely and legibly filled out (Title 128 - Chapter 17, 001).

- c. Lockwood failed to produce a copy of the manifest signed by the designated facility for manifests #7373127069, #8055697069 and #3522627069 (Attachments #8, #9, and #10). Subsequently Lockwood has failed to submit an Exception Report to the department.

A generator must submit an Exception Report to the Director if he has not received a copy of the manifest with the signature of the owner or operator of the designated facility within 45 days of the date the waste was accepted by the initial transporter (Title 128 - Chapter 18, 003.02B).

3. An inspection of the waste paint satellite storage area revealed the following areas of non-compliance:
 - a. There were several partially filled drums of waste paint and thinners with open bungs (pictures attached). When hazardous waste is stored in containers, the container holding the hazardous waste must always be closed except

when it is necessary to add or remove waste (Title 128 - Chapter 19, 004.01A2.).

- b. At the time of the inspection there was more than one 55-gallon drum of waste solvent in the satellite storage area.

A generator may accumulate as much as 55 gallons of hazardous waste in containers at or near any point of generation without a permit (Title 128 - Chapter 19, 004.04). A generator who accumulates hazardous waste in excess of this amount, must, with respect to the amount of excess waste, comply within three days with the full requirements of hazardous waste storage requirements including labels, dates of accumulation and weekly inspections (Title 128 - Chapter 19, 004.05).

- c. During the inspection of the waste paint storage area, two full drums were observed that could not be identified. The drums were not labeled and had open bungs.

It is the responsibility of the generator to determine if this waste is hazardous and if it is hazardous it must be handled accordingly.

Because of the cluttered nature of this area it was rather confusing to determine waste containers from empty drums or virgin products. The department recommends that the hazardous waste containers be kept separate from non-waste drums, to avoid potential problems.

- 4. Within the designated hazardous waste storage area, Lockwood is currently accumulating waste acid sludge from the waste acid storage tank (see picture). The manner in which the drums are being stored has not allowed adequate aisle space for emergency situations.

The generator shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of operation in an emergency (Title 128 - Chapter 27, 006).

- 5. Lockwood has not attempted to familiarize local hospitals with the properties of hazardous wastes handled and type of injuries or illnesses which could result from fires, explosions or releases at the site (Title 128 - Chapter 27, 007.01D).
- 6. From the accumulation dates on the waste paint sludges (2-19-86), Lockwood had four drums just exceeding the 90-day storage limit.

Number A generator who accumulates waste for more than 90 days is an operator of a storage facility and is subject to the requirements of Chapter 16 (Permits for Hazardous Waste Treatment, Storage or Disposal Facilities) and Chapter 21 (Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities) (Title 128 - Chapter 19, 004.02).

7. Lockwood Corporation could not provide evidence of a complete Personnel Training Plan.

As a full quantity generator, Lockwood is required to establish a plan of training for personnel who work with or near hazardous waste as outlined in Title 128 - Chapter 25.

There was some evidence of training associated with the galvanizing operation and the handling of the spent pickle liquor waste but these records were not very comprehensive. On the other hand there were no records at all for personnel handling the wastes generated in the painting processes.

Attachments

1. Hazardous Waste Inspection Form (2 pages).
2. Uniform Hazardous Waste Manifest No. 0056.
3. Uniform Hazardous Waste Manifest No. 0062.
4. Uniform Hazardous Waste Manifest No. 0063.
5. Uniform Hazardous Waste Manifest No. 86 (2 pages).
6. Uniform Hazardous Waste Manifest No. 00155.
7. Uniform Hazardous Waste Manifest No. 00086 (2 pages).
8. Uniform Hazardous Waste Manifest No. 7373127069.
9. Uniform Hazardous Waste Manifest No. 8055697069.
10. Uniform Hazardous Waste Manifest No. 3522627069.
11. Uniform Hazardous Waste Manifest No. 655197069.
12. Lockwood's Chemical and Hazardous Materials Use List (2 pages).
13. Galvanizing Waste Acid Sludge Disposal Log.
14. Paint Line Waste Solvent Disposal Log.
15. Spent Safety Solvent Pickup Log (2 pages).
16. Spent Acid Disposal Log (2 pages).
17. Hazardous Waste Training Record.
18. Photographs (4 pages).

RN/th

Total 180 pages

100% of waste manifest

13. Water supply in adequate volume and pressure? ☒ Yes ☐ No

14. What firm or Agency tests (and/or) ^{city, water} maintains the above equipment?

Factory Mutual Insurance

Farr Fire extinguishers

bering

(Name)

(Address)

Protec Alarms

Hastings.

15. Whenever hazardous waste is handled, all employees shall have immediate access to an internal alarm or through visual or voice contact with another employee, unless the State Fire Marshal has ruled that such a device is not required.

Yes

No

☒

☐

16. When one employee is on the premises during operation he shall have immediate access to a device capable of summoning external emergency assistance, unless the State Fire Marshal has ruled that such a device is not required.

☐

NA

☐

Never only one on duty alone

17. Has the owner/operator made arrangements with the local authorities to familiarized them with characteristics of the facility? (Layout of facility, properties of hazardous waste handled and associated hazards, places where facility personnel would normally be working, entrances to roads inside facility, possible evacuation routes)?

☒

☐

18. Has the owner/operator arranged to familiarize local hospitals with the properties of hazardous waste handled and types of injuries that could result from fires, explosions, or releases at the facility?

☐

☒

have two nurses on duty

CONTINGENCY PLAN (CH 28)

19. Is a copy of the Plan readily available on-site?

☒

☐

20. Has a copy of the Contingency Plan been submitted to DEC?

☒

☐

21. Have any changes occurred to require submittal of amendments?

☒

☐

REQUIREMENTS FOR IGNITABLE, REACTIVE OR INCOMPATIBLE WASTE (CH 25)

22. Does facility handle ignitable or reactive wastes?

☒

☐

23. If yes, is waste separated and confined from sources of ignition or reaction, (open flames, smoking, cutting and welding, hot surfaces, frictional heat) sparks (static, electrical or mechanical), spontaneous ignition and radiant heat?

☒

☐

24. Are "No Smoking" signs posted in hazardous areas?

☒

☐

25. Are containers containing ignitable or reactive wastes stored at least 50' from property line?

☒

☐

26. Do they have an adequate storage area for their hazardous wastes?

☒

☐



Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

Attachment 2
NATION EMERGENCY RESPONSE CENTER
(800) 424-8802

Ass hard you are making six (6) copies. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No. 2000-0404. Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 920100	Manifest Document No. 00050	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address Lockwood Corp. PO Box 160 Hwy 92 East Gering, Ne 4. Generator's Phone (308) 436-6340				A. State Manifest Document Number (Okla.) 19571		
5. Transporter 1 Company Name Chemical Resources, Inc.				6. US EPA ID Number OKD 00404396	B. State Generator's ID (Okla.) (93015)	
7. Transporter 2 Company Name				8. US EPA ID Number NRD 044101442	C. State Transporter's ID (Okla.) 2010	
9. Designated Facility Name and Site Address CHEMICAL RESOURCES INC. 2700 SO. 25th Ave. TULSA, OK. 10. US EPA ID Number OKD 00404396				D. Transporter's Phone 918-582-9595		
				E. State Transporter's ID (Okla.)		
				F. Transporter's Phone		
				G. State Facility's ID (Okla.) I W 73035		
				H. Facility's Phone 918-582-6994		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	Waste No.	
a. X H2SO4 Acid (1832RQ) Waste Sulfuric Acid Spent Corrosive Material		001	TT	4600 4700	G Okla. 020100 EPA D00020	
b.					Okla. EPA	
c.					Okla. EPA	
d.					Okla. EPA	
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above 68		
15. Special Handling Instructions and Additional Information 20550 22054 144						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.						
Printed/Typed Name		Signature		Date		
Rob Knoles, Lockwood Corp.		Bob Knoles		5/22/85		
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature		Date		
Printed/Typed Name		Signature		Date		
TENA MELTON		Tena Melton		5/22/85		
18. Transporter 2 Acknowledgement or Receipt of Materials		Signature		Date		
Printed/Typed Name		Signature		Date		
19. Discrepancy Indication Space						
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.						
Printed/Typed Name		Signature		Date		
				5/22/85		



Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

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Form Approved. OMB No. 2000-0404. Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address Lockwood Corporation Hwy 92 East		Gering, Ne.		A. State Manifest Document Number (Okla.) 19149		
4. Generator's Phone (308) 436-6340		69341		B. State Generator's ID (Okla.) 93015		
5. Transporter 1 Company Name Chemical Resources		6. US EPA ID Number OKD000402396		C. State Transporter's ID (Okla.) 2010		
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone 918-582-9595		
9. Designated Facility Name and Site Address Chemical Resources Tulsa, Ok.		10. US EPA ID Number OKD000402396		E. State Transporter's ID (Okla.) IW 73035		
				F. Transporter's Phone 918-582-6994		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers		13. Total Quantity	14. Unit	15. Waste No.
a. <input checked="" type="checkbox"/> HM H2SO4 Acid (1832RQ) Waste Sulfuric Spent Corrosive Material		No. Type 001 TT		4500	B	Okla. 02100 EPA D00020
b.						Okla. EPA
c.						Okla. EPA
d.						Okla. EPA
J. Additional Descriptions for Materials Listed Above		K. Handling Codes for Wastes Listed Above				
15. Special Handling Instructions and Additional Information 58837		147 135				
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.						
Printed/Typed Name Bob Knoles, Lockwood Corporation		Signature <i>Bob Knoles</i>		Date Month Day Year 8 5		
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature <i>Jena Malton</i>		Date Month Day Year 6 17 85		
18. Transporter 2 Acknowledgement of Receipt of Materials		Signature		Date Month Day Year		
19. Discrepancy Indication Space						
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						
Printed/Typed Name WILLIAM R. BRYANT		Signature <i>William R. Bryant</i>		Date Month Day Year 1 6 1985		



Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

NATIONAL EMERGENCY RESPONSE CENTER
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A Attachment 4

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Form Approved OMB No. 2000-0404 Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NED044101442	Manifest Document No. 00053	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address Lockwood Corporation Hwy 92 East Gering, Ne. 4. Generator's Phone (308) 436-6340 69341				A. State Manifest Document Number (Okla.) 19160		
5. Transporter 1 Company Name Chemical Resources				B. State Generator's ID (Okla.) 93015		
6. US EPA ID Number OKD00407396				C. State Transporter's ID (Okla.) 2010		
7. Transporter 2 Company Name				D. Transporter's Phone 918-582-9595		
8. US EPA ID Number				E. State Transporter's ID (Okla.)		
9. Designated Facility Name and Site Address Chemical Resources Tulsa, Ok.				F. Transporter's Phone		
10. US EPA ID Number OKD00407396				G. State Facility's ID (Okla.) IW73035		
				H. Facility's Phone 918-582-6994		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.	
a. HM H2SO4 Acid (1832RQ) Waste Sulfuric Spent Corrosive Material		No. Type 001 TT	4800	g.	Okla. 02100 EPA D00020	
b.					Okla. EPA	
c.					Okla. EPA	
d.					Okla. EPA	
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.						
Printed/Typed Name Bob Knoles, Lockwood Corporation				Signature Bob Knoles Date 6/17/85		
17. Transporter 1 Acknowledgement of Receipt of Materials				Date		
Printed/Typed Name CALVIN W. CHAPMAN				Signature Calvin W. Chapman Month Day Year 6/17/85		
18. Transporter 2 Acknowledgement of Receipt of Materials				Date		
Printed/Typed Name				Signature Month Day Year		
19. Discrepancy Indication Space						
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						
Printed/Typed Name D. J. Williams				Signature D. J. Williams Date 6/17/85		

GENERATOR

TRANSPORTER

FACILITY

DEPARTMENT OF WATER RESOURCES

Box 13087, Capitol Station

Austin, Texas 78711



Use print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2000-0404. Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NED044101442		Manifest Document No. 86		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address LOCKWOOD CORPORATION P.O. Box 160 GERING, NE 69341						A. State Manifest Document Number 00106069			
4. Generator's Phone (308) 436-5051						B. State Generator's ID 99931			
5. Transporter 1 Company Name ENVIRONMENTAL TRANSPORTATION SERVICE						6. US EPA ID Number OKD981056799		C. State Transporter's ID 40040	
7. Transporter 2 Company Name						8. US EPA ID Number		D. Transporter's Phone 405-424-0030	
9. Designated Facility Name and Site Address GIBRALTAR CHEMICAL RESOURCES INC. HWY 155 South WINONA, TEXAS 75792						10. US EPA ID Number TXD000742304		E. State Transporter's ID	
								F. Transporter's Phone	
								G. State Facility's ID WDW-186	
								H. Facility's Phone 214-877-3227	
11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)					12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.
X	a. SULFURIC ACID, SPENT UN 1832 CORROSIVE MATERIAL					001	TT	400.7	G 900190
	b.								
	c.								
	d.								
J. Additional Descriptions for Materials Listed Above EPA WASTE NO- K062, CORROSIVE DRY WEIGHT 221.53 GRAMS/LITER						K. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.									
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.									
Printed/Typed Name BOB KNOLES LOCKWOOD CORPORATION						Signature <i>Bob Knoles</i>		Date 12/26/85	
17. Transporter 1 Acknowledgement of Receipt of Materials									
Printed/Typed Name <i>Bob Calvey</i>						Signature <i>Bob Calvey</i>		Date 12/26/85	
18. Transporter 2 Acknowledgement of Receipt of Materials									
Printed/Typed Name						Signature		Date	
19. Discrepancy Indication Space Reject Load - Solids too high for injection									
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.									
Printed/Typed Name						Signature		Date Month Day Year	

ER COMMISSION
8087, Capitol Station
exas 78711-3087



Form Approved. OMB No. 2000-0404. Expires 7-3

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No.

2. Page 1

Information in the shaded area is not required by Federal law.

3. Generator's Name and Mailing Address

LOCKWOOD CORPORATION

P.O. Box 160

GERING, NE 69341

4. Generator's Phone (308) 436-5051

5. Transporter 1 Company Name

ENVIRONMENTAL TRANSPORTATION SERVICE

6. US EPA ID Number

OKD 98105679

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address

D. S. I.

2401 BATTLEGROUND ROAD

DEERPARK, TEXAS 77536

10. US EPA ID Number

TXD 000719518

A. State Manifest Document Number

N 00251001

B. State Generator's ID

99931

C. State Transporter's ID

40040

D. Transporter's Phone

05-424-0030

E. State Transporter's ID

F. Transporter's Phone

G. State Facility's ID

WDW 169

H. Facility's Phone

713-478-1000

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

a. SULFURIC ACID, SPENT UN 1832
CORROSIVE MATERIAL

12. Containers
No. Type

100 001 TIT

13. Total Quantity

5346

14. Unit Wt/Vol

14007 G

15. Waste No.

900190

b.

c.

d.

PLEASE NOTE CHANGE IN QUANTITY ON TDWR MANIFEST #00251001 AND ADJUST YOUR STATE REPORT ACCORDINGLY. IT IS REQUIRED THAT WE SHOW THE AMOUNT IF ACTUAL VARIES BY GREATER THAN 10%.

J. Additional Descriptions for Materials Listed Above

EPA WASTE NO - K062, CORROSIVE

DRY WEIGHT - 22455 GRAMS

22455 / 1.849 = 12145.5

6.42 T

K. Handling Codes for Wastes Listed Above

44240 W 2

1104 200 X 1.849 = 2000

4002 2000 = 8000

3.7 TON

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of processing, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.

Printed/Typed Name

BOB KNOLES LOCKWOOD CORPORATION

Signature

Bob Knoles by C. C. Knoles

Month Day

11/23/11

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

BOB CALVERY

Signature

Bob Calvery

Month Day

11/23/11

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

DR. K. KNOLES

Signature

Dr. K. Knoles

Month Day

10/11/11

Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

Attachment 6
NATIONAL EMERGENCY RESPONSE CENTER:
(800) 424-8802

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Form Approved. OMB No. 2000-0404. Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. N E D O 4 4 1 0 1 4 4 2	Manifest Document No. 0 0 1 5 5	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address LOCKWOOD CORPORATION P.O. BOX 160 HWY 92 EAST GERING NE 69341				A. State Manifest Document Number (Okla.) 8747		
4. Generator's Phone (308) 436-6340				B. State Generator's ID (Okla.) 93015		
5. Transporter 1 Company Name U.S. POLLUTION CONTROL, INC.				C. State Transporter's ID (Okla.) 2004		
6. US EPA ID Number 60K098				D. Transporter's Phone 405-528-8371		
7. Transporter 2 Company Name				E. State Transporter's ID (Okla.)		
8. US EPA ID Number				F. Transporter's Phone		
9. Designated Facility Name and Site Address U.S. POLLUTION CONTROL, INC. 180A RT. 2 BOX 180A (LONE MOUNTAIN DISPOSAL FACILITY) WAYNOKA, OK. 73860				G. State Facility's ID (Okla.) SD47002		
10. US EPA ID Number ID K D O 6 5 4 3 8 3 7 6				H. Facility's Phone 405-528-8371		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers	13. Total Quantity	14. Unit	Waste No.	
HM		No.	Type	Quantity	Unit	
a.	X	HAZARDOUS WASTE SOLID, NOS, ORME N9189 SOLIDS, CORROSIVE, N.O.S. (ACID SLUDGE) WASTE MATERIAL	005	D M	02500	Okla. 464714 EPA K062
b.	X	CORROSIVE SOLIDS, N.O.S. UN 1759 (CAUSTIC SLUDGE) WASTE MATERIAL	019	D M	13300	Okla. 630404 EPA 20002
c.						Okla. 218735 EPA
d.						Okla. 218735 EPA
J. Additional Descriptions for Materials Listed Above a) Sulfuric acid sludge b) Sodium hydroxide caustic sludge				K. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information CORROSIVE SOLIDS, KEEP DRY						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.						
Printed/Typed Name BOB KNOLES, Lockwood Corporation				Signature Bob Knoles		
17. Transporter 1 Acknowledgement of Receipt of Materials				Date Month Day Year 10 21 06		
Printed/Typed Name TERRY PHILLIPS				Signature Terry Phillips		
18. Transporter 2 Acknowledgement or Receipt of Materials				Date Month Day Year 7 6 96		
Printed/Typed Name				Signature		
19. Discrepancy Indication Space GENERATOR (BOB KNOLES) NOTIFIED OF MANIFEST CHANGES 2-12-86						
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.						
Printed/Typed Name				Signature		
				Date Month Day Year 10 21 06		

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NE D044101442		Manifest Document No. 00086		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address Lockwood Corporation East Hwy 92 PO Box 160 Gering N.C. 69341						A. State Manifest Document Number							
4. Generator's Phone (308) 436-5051						B. State Generator's ID							
5. Transporter 1 Company Name Nebraska Solvents Co						C. State Transporter's ID							
6. US EPA ID Number NE D035036169						D. Transporter's Phone 308-381-3063							
7. Transporter 2 Company Name Watts Trucking Service						E. State Transporter's ID 0225							
8. US EPA ID Number IL D045376100						F. Transporter's Phone 309/788-3421							
9. Designated Facility Name and Site Address LWD Inc Hwy 1523 PO Box 327 Calvert City, KY 42029						G. State Facility's ID							
10. US EPA ID Number KY D088438817						H. Facility's Phone 502/395-8311							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
						No. Type							
a. <input checked="" type="checkbox"/> Waste Paint Flammable													
X Liquid N.O.S. UN 1993						15 M		0825		1		D001	
b. <input checked="" type="checkbox"/> Waste Paint Solid													
X Flammable Solid NOS UN 1993						09 M		0495		1		D001	
c.													
d.													
J. Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above							
Item A PCN # DW 13						T06/T07							
Item B PCN # DW 14													
15. Special Handling Instructions and Additional Information Original Manifest Improperly Prepared, corrected manifest prepared by Paul Myers of Watts Trucking Service, Inc per phone call to Steve Groatius													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.													
Printed/Typed Name Bob Knoles						Signature Bob Knoles						Month Day Year 4 23 86	
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature RJ Alderson						Month Day Year 4 23 86	
Printed/Typed Name R.J. Alderson													
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature Bill Goeken						Month Day Year 4 24 86	
Printed/Typed Name Bill Goeken													
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Chris Dunnigan						Signature Chris Dunnigan						Month Day Year 4 28 86	

UNIFORM HAZARDOUS WASTE MANIFEST		Generator's US EPA ID No.	Manifest Document No.	Page 1 of 1	Information in the shaded areas is not required by Federal law.
3. Generator's Name and Mailing Address Lockwood Corporation East Highway 92 Gering, Nebraska 69341		4. Generator's Phone (308) 382-5051	5. US EPA ID Number NEID01031011617	6. Manifest Document No. 00000001816	A. State Manifest Document Number
7. Transporter 1 Company Name NEBRASKA SOLVENTS COMPANY		8. Transporter 2 Company Name WATTS DISPOSAL SYSTEMS	9. US EPA ID Number NEID01031011619	10. US EPA ID Number ILID044513761100	B. State Generator's ID C. State Transporter's ID D. Transporter's Phone 308-382-3063 E. State Transporter's ID F. Transporter's Phone 309-331-3621
9. Designated Facility Name and Site Address BYXEXCEL LTD, Inc. Off Highway 1523, P.O. Box 327 Calvert City, Kentucky 42029		10. US EPA ID Number KYID01031011617		G. State Facility's ID H. Facility's Phone (502) 491-5333	
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)			12. Containers	13. Total Quantity	14. Waste No.
a. Waste Paint, Flammable Liquid N.O.S. UN 1993			No. Type	Quantity	Waste No.
b. WASTE PAINT SOLID FLAMMABLE SOLID N.O.S. UN 1993			015 dm	00825	631
c.			017 dm	00495	632
d.					
J. Additional Descriptions for Materials Listed Above			K. Handling Codes for Wastes Listed Above		
List A Components Waste Paint LMD Product Code pH 12.13		List B Components WASTE PAINT SOLID FROM GASKETS pH 12.14			
15. Special Handling Instructions and Additional Information DRUMS MUST NOT BE LEAKING. ALL BUNGS MUST BE TIGHT WITH GASKETS.					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.					
Printed/Typed Name BOB KATZ		Signature [Signature]		Month Day Year 10/13/86	
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature [Signature]		Month Day Year 10/13/86	
18. Transporter 2 Acknowledgement of Receipt of Materials		Signature [Signature]		Month Day Year 10/13/86	
19. Discrepancy Indication Space					
20. Facility Owner or Operator. Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.					
Printed/Typed Name		Signature		Month Day Year	

EPA Form 8700-22 (Rev. 4-86) Previous edition is obsolete.

white copy: TSDS Records

yellow copy: Transporter retains

pink copy: TSDS sends to generator

gold copy: Generator retains

WASTE MANIFEST		Generator's US EPA ID No. <i>NEV 044101442</i>	Manifest Document No.		2. Page 1 of	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address <i>SAFETY-KLEEN CORP.</i>					A. State Manifest Document Number		
4. Generator's Phone (<i>303</i>) <i>430-5001</i>					B. State Generator's ID		
5. Transporter 1 Company Name <i>SAFETY-KLEEN CORP.</i>			6. US EPA ID Number		C. State Transporter's ID		
7. Transporter 2 Company Name			8. US EPA ID Number		D. Transporter's Phone <i>303 753 6230</i>		
9. Designated Facility Name and Site Address <i>SAFETY-KLEEN CORP.</i>			10. US EPA ID Number		E. State Transporter's ID		
					F. Transporter's Phone		
					G. State Facility's ID		
					H. Facility's Phone		
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)					12. Containers No.	Type	13. Total Quantity
a. <input checked="" type="checkbox"/> HM Waste, Petroleum Naphtha, Combustible Liquid, UN 1255 D001					1	DM	6
b. Waste, Compound, Cleaning, Liquid, Corrosive Material, NA 1760 F002-F004						DM	
c. Waste, Perchloroethylene, ORM-A, UN 1897 F002						DM	
d.							
J. Additional Descriptions for Materials Listed Above					K. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information <i>2-01-7030</i> <i>047312</i> <i>TROR 32</i>							
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.							
Printed/Typed Name <i>SAFETY-KLEEN CORP.</i>					Signature <i>[Signature]</i>		Date Month Day Year
17. Transporter 1 Acknowledgement of Receipt of Materials							
Printed/Typed Name <i>SAFETY-KLEEN CORP.</i>					Signature <i>[Signature]</i>		Date Month Day Year <i>12/15</i>
18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name					Signature		Date Month Day Year
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.							
Printed/Typed Name					Signature		Date Month Day Year

Please print or type. (Form designed for use on a (12-pitch) typewriter.)

Form Approved. OMB No. 2000-0404. Expires 7-31-85

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NE0044101442		Manifest Document No.		2. Page 1 of		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address SAFETY-KLEEN CORP.						A. State Manifest Document Number							
4. Generator's Phone () - -						B. State Generator's ID							
5. Transporter 1 Company Name			6. US EPA ID Number			C. State Transporter's ID							
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone							
9. Designated Facility Name and Site Address SAFETY-KLEEN CORP.			10. US EPA ID Number			E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers No.		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. <input checked="" type="checkbox"/> HM Waste, Petroleum Naphtha, Combustible Liquid, UN 1255 D001						1		DM		200		P	
b. Waste, Compound, Cleaning, Liquid, Corrosive Material, NA 1760 F002-F004								DM					
c. Waste, Perchloroethylene, ORM-A, UN 1897 F002								DM					
d.													
J. Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above							
15. Special Handling Instructions and Additional Information 0-052-03-7069 005569													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.													
Printed/Typed Name						Signature						Date Month Day Year	
17. Transporter 1 Acknowledgement of Receipt of Materials												Date Month Day Year	
Printed/Typed Name						Signature						Date Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials												Date Month Day Year	
Printed/Typed Name						Signature						Date Month Day Year	
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.												Date Month Day Year	
Printed/Typed Name						Signature						Date Month Day Year	

EPA FORM 8700-22 (3-84)

GENERATOR COPY

Please print or type. (Form designed for use on a 12-pitch) typewriter.)

Form Approved. OMB No. 2000-0404. Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No. 1655197069		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address Lockwood Corp Gering Ne						A. State Manifest Document Number							
4. Generator's Phone (308) 436-5051						B. State Generator's ID							
5. Transporter 1 Company Name Safety-Kleen Corp				6. US EPA ID Number NE000687178		C. State Transporter's ID							
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone 436-2600							
9. Designated Facility Name and Site Address SAFETY-KLEEN CORP. RT 1 Box 15 E Gering Ne 69341				10. US EPA ID Number NE000687178		E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone 308/436-2600							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. <input checked="" type="checkbox"/> Waste, Petroleum Naphtha, Combustible Liquid, UN 1255 D001						1		DM		80		P Pool	
b. <input type="checkbox"/> Waste, Compound, Cleaning, Liquid, Corrosive Material, NA 1760 F002-F004								DM					
c. <input type="checkbox"/> Waste, Perchloroethylene, ORM-A, UN 1897 F002								DM					
d. <input type="checkbox"/>													
J. Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above							
15. Special Handling Instructions and Additional Information													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.													
Printed/Typed Name BRENDA BENZEL						Signature Brenda Benzel				Date 4/1/86			
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature Larry Meininger				Date 4/1/86			
Printed/Typed Name Larry Meininger						Signature Larry Meininger				Date 4/1/86			
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature				Date			
Printed/Typed Name						Signature				Date			
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Rick Thomas						Signature Rick Thomas				Date 4/1/86			

CHEMICAL AND HAZARDOUS MATERIAL USE LIST

LOCKWOOD CORPORATION
P.O. BOX 160 HWY 92 E.
GERING NE 69361

EPA ID #: NED044101442

27-Mar-86

PRODUCT NAME	MANUFACTURER	CHEMICAL NAME	MSDS DEPT. FILE #	HAZARD	USE	ANNUAL USAGE	DISPOSAL
1383 GREEN SINGLE COMPONENT ALIPHATIC URETHANE	HEINTZEN COATINGS, INC.	POLYESTER-POLYISOCYANATE	922/925	IFLAMMABLE	PAINT		
ACETONE	EXXON	12-PROPANONE	922/925	IFLAMMABLE	SOLVENT		
ACID COMONET FOR 21106UP	HEINTZEN COATINGS, INC.			IFLAMMABLE			
ACID COMONET FOR 2111SSC	HEINTZEN COATINGS, INC.			IFLAMMABLE			
ALCOHOL	EXXON	ISOPROPYL ALCOHOL (IPH)	922	IFLAMMABLE	SOLVENT		
ANHYDROUS AMMONIA	WIRDOES	ANHYDROUS AMMONIA	945	UNKNOWN	PREFLUX ADDITIVE		
ANILIN CHLORIDE	MCKESSON CHEMICAL	BARIUM CHLORIDE	945	POISON	PREFLUX ADDITIVE		
CA EPOXY CATALYST	HEINTZEN COATINGS, INC.	AMIDE RESIN	922/925	IFLAMMABLE			
CA URETHANE CATALYST	HEINTZEN COATINGS, INC.	ALIPHATIC POLYISOCYANATE	925	IFLAMMABLE	PAINT ADDITIVE		ITWDF (INCINERATION)
CELLOSOLVE ACETATE	UNION CARBIDE	12-ETHOXYETHYL ACETATE	922	IFLAMMABLE			
ICIMCOOL FIVE STAR 40	ICINCINNATI MILACRON		930	UNKNOWN	MACHINING FLUID		ISEWER DISCHARGE NO PRETREATMENT
ICIMCOOL FIVE STAR 40	ICINCINNATI MILACRON		934	UNKNOWN	MACHINING FLUID		ISEWER DISCHARGE NO PRETREATMENT
ICIMCOOL FIVE STAR 40	ICINCINNATI MILACRON		920	UNKNOWN	MACHINING FLUID		ISEWER DISCHARGE NO PRETREATMENT
ICIMCOOL FIVE STAR 40	ICINCINNATI MILACRON		936	UNKNOWN	MACHINING FLUID		ISEWER DISCHARGE NO PRETREATMENT
ICIMPERIAL 1011	ICINCINNATI MILACRON						
ICOR ADD 37	ICORAL CHEMICAL CO.		922		CLEANER ADDITIVE		
ICOR ADD 911	ICORAL CHEMICAL CO.	DIETHYLENE GLYCOL MONOBUTYL ETHER	922		CLEANER ADDITIVE		
ICOR ADD 927	ICORAL CHEMICAL CO.	AMMONIUM HYDROXIDE	922				
ICOR ADD AL	ICORAL CHEMICAL	AMMONIUM BIFLUORIDE			AL TREATMENT		
ICOR POP 03	ICORAL CHEMICAL				PAINT STRIPPER		ITWDF
ICORTAK 900	ICORAL CHEMICAL CO.	POTASSIUM HYDROXIDE	947	ICORROSIVE	PAINT STRIPPER		ITWDF (SLUDGE ONLY)
ENAMELS, VINYL, CHASSIS BLACK, DUCO BLACK	IDU PONT			IFLAMMABLE			
ENAMEL, CENTARI ACRYLIC	IDU PONT			IFLAMMABLE			
ENAMEL, DARK BLUE AIR DRY	ICOOK PAINT AND VARNISH COMPANY		922		PAINT		ITWDF (INCINERATION)
ENAMEL, DULUX ALKYD	IDU PONT			IFLAMMABLE			
ENAMEL, FAST DRY INDUSTRIAL BLACK	ICONTINENTAL PRODUCTS COMPANY	ALKYD RESIN ENAMEL	922	IFLAMMABLE			
ENAMEL, FAST PRODUCTION, BEIGE	SHERWIN-WILLIAMS COMPANY	ALKYD ENAMEL	922	IFLAMMABLE	PAINT		ITWDF (INCINERATION)
ENAMEL, IMRON POLYURETHANE	IDU PONT			IFLAMMABLE	PAINT		
ENAMEL, #33 YELLOW URA-ZEN	HEINTZEN COATINGS, INC.	POLYESTER URETHANE	925	IFLAMMABLE	PAINT		ITWDF (INCINERATION)
FLASH CLENE 26	ICORAL CHEMICAL	CAUSTIC SODA					
HIGH GLOSS BLACK #1079N & 1060 W/DRYER	ICREATIVE COATINGS COMPANY, INC.	ALKYD	922/925	IFLAMMABLE	PAINT		ITWDF (INCINERATION)
IHT-50	IBIOTECHNICS INC.	SODIUM HYDROXIDE	945	ICORROSIVE	STRIPPER		ISLUDGE TO TWDF
HYDROCHLORIC ACID	IVANWATERS & RODGERS	HYDROCHLORIC ACID	941	ICORROSIVE	PICKLE IRON	1550 GAL.	
ISOCYANATE ACTIVATORS HARDENERS & ADDITIVES	IDU PONT			IFLAMMABLE			

CHEMICAL AND HAZARDOUS MATERIAL USE LIST

LOCKWOOD CORPORATION
P.O. BOX 160 HWY 92 E.
GERING NE 69361

EPA ID #: NED044101442

27-Mar-86

PRODUCT NAME	MANUFACTURER	CHEMICAL NAME	DEPT.	MSDS FILE #1	HAZARD	USE	ANNUAL USAGE	DISPOSAL
IKEM JET SEAL	ISHERWIN-WILLIAMS COMPANY	IPRIMER SEALERS	925					
ILACQUER, LUCITE ACRYLIC	IDU PONT		925		IFLAMMABLE	IPAIN		ITWDF (INCINERATION)
ILOCKWOOD WR GREEN	IROCKFORD COATINGS		922		ICOMBUSTIBLE	IPAIN		ITWDF (INCINERATION)
ILPS 3 HEAVY DUTYRUST INHIBITOR	IHOLT LLOYD CORPORATION	IPETROLEUM HYDROCARBONS	1933/9221					
IMETHYL ETHYL KETONE, MEK	IEXXON	IMETHYL ETHYL KETONE, MEK	922		IFLAMMABLE			
IMIBK	IEXXON	IMETHYL ISOBUTYL KETONE	922		IFLAMMABLE	ISOLVENT		
IN-SOL 150	IAMSCO		922		ICOMBUSTIBLE	ISOLVENT		ISOLVENT RECLAIMER
IPERCHLOROETHYLENE, PERC/140	ISTREETS	ITETRACHLOROETHYLENE	925		INONE	ISAFETY SOLVENT		
Iph MINUS	ICORAL CHEMICAL CO.		922			IWASH ADDITIVE		IN/A
IPOLASOL	ISHERWIN-WILLIAMS COMPANY	IACRYLIC ENAMEL HARDENER	925			IPAIN ADDITIVE		
IPOLASOL PLUS	ISHERWIN-WILLIAMS COMPANY	IACRYLIC ENAMEL HARDENER	925			IPAIN ADDITIVE		
IPOLY VINYL & BUTYRAL	IPREMIUM FINISHES INC.	IPOLY VINYL & BUTYRAL	1922/9251			IWASH PRIMER		
IPREACT (PREFLUX)	IMINERAL RESEARCH & DEVELOP. CORP.	IZINC AMMONIUM CHLORIDE	945			ISALVANIZING FLUX		
IPRIMER A, WHITE LEAD & CHROME FREE EPOXY	INILES CHEMICAL PAINT COMPANY		1922/9251		IFLAMMABLE	IPAIN		ITWDF (INCINERATION)
IPRIMER B, WHITE LEAD & CHROME FREE EPOXY	INILES CHEMICAL PAINT COMPANY		1922/9251		IFLAMMABLE	IPAIN		ITWDF (INCINERATION)
IPRIMER, LIGHT GREY	IROCKFORD COATINGS		1922/9251		ICOMBUSTIBLE	IPAIN		ITWDF (INCINERATION)
IPRIMER, SHOP COAT, GRAY	ISHERWIN-WILLIAMS COMPANY	IALKYD PAINT	1922/9251		IFLAMMABLE	IPRIMER		
IPRIMER, STRUCTURAL STEEL #2375 LIGHT GRAY	ICONTINENTAL PRODUCTS COMPANY	IAIR DRY ALKYD RESIN PRIMER	922		IFLAMMABLE	IPRIMER		
IPRIMER, VINYL WASH	ISHERWIN-WILLIAMS COMPANY		1922/9251			IVINYL WASH PRIMER		
ISODA ASH	IALLIED CHEMICAL CORP.	ISODIUM CARBONATE ANHYDROUS	945		INONE	INEUTRALIZE ACID		
ISTOP-RUST, RED OXIDE	IRUST-OLEUM CORPORATION		1922/9251		IFLAMMABLE	IPRIMER		
ISULFURIC ACID	ICHEMICAL MARKETING	ISULFURIC ACID 66 BAUME	945		ICORROSIVE	IPICKLE IRON		ITWDF
ISUNFIRE 421	ISHERWIN-WILLIAMS COMPANY	IACRYLIC URETHANE ENAMEL	925			IPAIN		
ISURCOAT 901	ICORAL CHEMICAL CO.	IPHOSPHORIC ACID MOLYBDENUM	1922/9251			ICLEANER		
ISURCOAT 903	ICORAL CHEMICAL CO.	IRON PHOSPHATE	922		ICORROSIVE	IWASH CLEANER		ISEWER DISCHARGE (NEUTRALIZE)
ITOLUENE (TOLUOL)	IAMSCO	ITOLUOL	922		IFLAMMABLE	ISOLVENT		IRECYCLER
IWM FLUX ADDITIVE	IWM, INC.		945		INONE	IPREFLUX ADDITIVE		IN/A
IXYLENE (XYLOL)	IAMSCO	IXYLOL	922		IFLAMMABLE	ISOLVENT		IRECYCLER
IKLENZ DIP (L1011A)	ICROWN CHEMICAL	IPOLYAMINE	945		INONE	IACID ADDITIVE		IN/A

cc: Norm Walton
Gunter Koob
Larry Johnson

SLUDGE85 DISPOSAL LOG DATE PICK UP	POUNDS	L/W MANIFEST NUMBER	OKLA. MANIFEST NUMBER	B/L	16-Jul-85 U.S. POLLUTION CONTROL SHIPPING COST \$	DISPOSAL COST \$	TOTAL COST \$	DRUMS
06/14/85	16,000	00150	19150	17667	\$1,926.25	\$2,983.29	\$4,909.54	50
06/17/85	34,750	00151	19151	17668	\$1,926.25	\$2,981.45	\$4,907.70	50
06/19/85	34,750	00152	19152	18359	\$1,926.25		\$1,926.25	50
06/21/85	34,750	00153	19153	18360	\$1,926.25	\$3,116.55	\$5,042.80	50
06/24/85	32,665	00154	19154	18361	\$1,926.25		\$1,926.25	47
<hr/>								
TOTAL :	152,915 POUNDS				\$9,631.25	\$9,081.29	\$18,712.54	247

1985 QUARTERLY TOTALS

FIRST QUARTER	POUNDS
	152,915

cc R. DUGAN (2)
BOB KNOLES

DEB'S
BOOK LOG

GALVANIZING WASTE ACID SLUDGE DISPOSAL

17-Jan-86

U. S. POLLUTION CONTROL

DATE BOOK UP	POUNDS	LOCKWOOD MANIFEST NUMBER	OKLAHOMA MANIFEST NUMBER	BILL OF LADING	SHIPPING COST \$	DISPOSAL COST \$	TOTAL COST \$	DRUM
6/85	16,000	00150	19150	17667	\$1,926.25	\$2,983.29	\$4,909.54	50 5
7/85	34,750	00151	19151	17668	\$1,926.25	\$2,981.45	\$4,907.70	50 5
9/85	34,750	00152	19152	18359	\$1,926.25	\$2,985.71	\$4,911.96	50 5
11/85	34,750	00153	19153	18360	\$1,926.25	\$2,986.55	\$4,912.80	50 5
12/85	32,665	00154	19154	18361	\$1,926.25	\$3,260.15	\$5,186.40	47 4
TOTAL :					\$9,631.25	\$15,197.15	\$24,828.40	24

SOLVENTS

PAINT LINE WASTE SOLVENT DISPOSAL LOG

02-May-86

NEBRASKA SOLVENTS CO.

DATE PICK UP	GALLONS	LOCKWOOD MANIFEST NUMBER	N. S. C. MANIFEST NUMBER	BILL OF LADING	SHIPPING & DISPOSAL COST (DOLLARS)	DRUMS
01/14/86	880	00043	00043	137148	\$2,810.40	16
01/15/86	2,145	00044	00044	137150	\$6,850.10	39
02/26/86	990	00045	00035	137589	\$2,698.00	18
04/23/86	1,320	00086	00086	138062	\$6,062.50	24
=====						
TOTAL :	5,335 GALLONS				\$18,421.00	97

cc R. Dugan
B. Knoles

SPENT SAFETY SOLVENT PICK UP LOG
30-Jan-86

GENERATOR:

Lockwood Corporation
Hwy 92 East Box 160
Gering, NE 69341
(308) 436-5051

US EPA ID NO. NED044101442

TRANSPORTER/FACILITY:

SAFETY-KLEEN-CORPORATION
RR 1 Box 15E
Gering, NE 69341
(308) 436-2600

US EPA ID NO. NED000687178

WASTE, PETROLEUM NAPHTHA, COMBUSTIBLE LIQUID, UN1255
EPA # D001

DATE PICK UP	POUNDS	CONTAINERS	MANIFEST DOCUMENT NO.
108-10-85	160	2	10659
108-10-85	960	12	10654
108-10-85	560	7	A00000044144
108-10-85	400	5	A00000044145
108-10-85	160	2	A00000044146
108-10-85	640	8	A00000078226
108-28-85	320	4	7373127069
109-06-85	320	4	8055697069
109-09-85	320	4	8716917069
109-16-85	240	3	9404807069
109-16-85	240	3	9404817069
109-24-85	320	4	0083807069
110-03-85	160	2	010668
110-07-85	320	4	1455407069
110-18-85	480	6	0780037069
110-25-85	400	5	2823977069
110-31-85	240	3	3522627069
111-04-85	320	4	4184607069
111-12-85	80	1	4876667069
111-19-85	240	3	5573297069
111-27-85	240	3	6270207069
112-07-85	80	1	6943097069
112-13-85	560	7	7643767069
112-18-85	240	3	8415047069
112-27-85	160	2	9183927069
	8,160	102	11985 TOTALS

RECEIVED

FEB 13 1986

DEPARTMENT OF
ENVIRONMENTAL CONTROL

Roy R. Dugan
2/10/86

GENERATOR:

Lockwood Corporation
Hwy 92 East Box 160
Gering, NE 69341
(308) 436-5051

US EPA ID NO. NED044101442

TRANSPORTER/FACILITY:

SAFETY-KLEEN-CORPORATION
RR 1 Box 15E
Gering, NE 69341
(308) 436-2600

US EPA ID NO. NED000687178

WASTE, PETROLEUM NAPHTHA, COMBUSTIBLE LIQUID, UN1255
EPA # D001

[illegible]

ACID86

29-May-86

SPENT ACID DISPOSAL LOG

DATE PICK UP	GALLONS	DRY TONS	LOCKWOOD MANIFEST NUMBER	TEXAS MANIFEST NUMBER	BILL OF LADING	E. T. S. SHIPPING COST \$	DISPOSAL COST \$	TOTAL COST \$	AVERAGE PER. GAL. COST \$
01/21/86	4,016	3	00088	123576	3697	\$3,033.00	\$826.84	\$3,859.84	\$0.9611
01/21/86	4,200	4	00089	123575	3906	\$3,033.00	\$809.84	\$3,842.84	\$0.9375
01/23/86	2,955	2	00090	250997	3907	\$3,033.00	\$608.31	\$3,641.31	\$1.0155
01/23/86	3,922	3	00091	250998	3883	\$3,033.00	\$807.43	\$3,840.43	\$1.0061
02/13/86	4,125	3	00092	250999	4028	\$2,932.00	\$846.08	\$3,778.08	\$0.9867
02/14/86	4,074	3	00093	243247	3807	\$2,932.00	\$835.76	\$3,767.76	\$0.9759
02/17/86	3,751	3	00094	243245	3808	\$2,932.00	\$770.45	\$3,702.45	\$0.9774
02/17/86	4,323	4	00095	250996	4029	\$2,932.00	\$886.11	\$3,818.11	\$0.9644
03/06/86	3,877	3	00096	220647	4034	\$2,932.00	\$795.93	\$3,727.93	\$0.9641
03/06/86	3,016	3	00097	220648	3618	\$2,932.00	\$621.84	\$3,553.84	\$0.9810
03/17/86	3,342	3	00098	198097	3443	\$2,932.00	\$687.75	\$3,619.75	\$0.9892
03/17/86	4,016	3	00099	198098	3838	\$2,932.00	\$824.04	\$3,756.04	\$0.9845
03/24/86	3,364	3	00100	198095	4576	\$2,932.00	\$692.20	\$3,624.20	\$0.9908
03/24/86	2,968	2	00101	198094	3624	\$2,932.00	\$608.13	\$3,540.13	\$1.0024
05/23/86	4,320	4	00102	198093	5110				
05/23/86	3,971	3	00103	198092	4736				

TOTAL 1986	60,240	49				\$41,452.00	\$10,620.71	\$60,383.45	(ESTIMATE)
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cc R. Dugan
B. Knoles
G. Johnson

RECEIVED

SPENT ACID DISPOSAL LOG

16-Jan-86

JAN 30 1986

DATE PICK UP	GALLONS	LOCKWOOD MANIFEST NUMBER	OKLAHOMA MANIFEST NUMBER	BILL OF LADING	ENVIRONMENTAL CONTROL
01/03/85	5,000	00016	-----	17544	
01/07/85	5,000	00017	-----	17567	
01/10/85	4,300	00018	-----	17585	
01/14/85	4,300	00019	-----	17619	
01/14/85	4,300	00020	-----	17620	
01/14/85	4,300	00021	-----	17621	
01/21/85	4,500	00022	-----	17683	
01/23/85	5,000	00023	-----	17692	
01/29/85	4,600	00024	-----	17722	
02/04/85	4,300	00025	-----	17756	
02/06/85	4,800	00026	-----	17770	
02/15/85	4,600	00027	-----	17929	
02/15/85	4,300	00028	-----	17928	
02/18/85	4,500	00029	-----	17945	
02/18/85	4,600	00030	-----	17951	
02/18/85	4,500	00031	-----	17952	
02/19/85	4,500	00032	-----	17953	
02/23/85	4,300	00033	-----	17988	
02/26/85	4,500	00034	-----	18010	
02/26/85	4,500	00035	-----	18011	
02/27/85	4,000	00036	-----	18023	
03/29/85	4,700	00037	-----	18071	
04/02/85	4,800	00038	19553	17816	
04/06/85	4,600	00039	19554	17486	
04/06/85	4,600	00040	19555	17847	
04/11/85	4,500	00041	19556	17882	
04/11/85	4,364	00042	19557	17883	
04/12/85	4,600	00043	19558	17892	
04/12/85	4,600	00044	19559	17891	
04/15/85	4,200	00045	19561	18109	
04/15/85	4,200	00046	19560	18107	
04/19/85	4,600	00047	19562	18137	
04/19/85	4,600	00048	19563	18138	
04/25/85	4,500	00049	19564	18173	
04/25/85	4,000	00050	19565	18178	
05/02/85	4,500	00051	19566	18221	
05/02/85	4,600	00052	19567	18225	
05/13/85	4,500	00053	19568	18277	
05/13/85	4,500	00054	19569	18275	
05/13/85	4,700	00055	19570	18276	
05/22/85	4,600	00056	19571	18338	
05/22/85	4,700	00057	19572	18339	
05/30/85	4,100	00058	19573	18390	
05/30/85	4,600	00059	19574	19391	
05/31/85	4,500	00060	19550	18398	
06/12/85	4,000	00061	19552	18458	
06/17/85	4,500	00062	19149	18491	
06/17/85	4,800	00063	19160	18492	
06/18/85	2,500	00064	19161	18497	
07/01/85	4,500	00065	19162	18578	
07/01/85	4,600	00066	19163	18579	
07/02/85	4,600	00067	19164	18591	
07/02/85	4,700	00068	19165	18590	
07/29/85	4,400	00069	19166	18725	

(Has your Waste Handling)

[illegible]



WASTE PAINT ACCUMULATION AREA
6-2-86



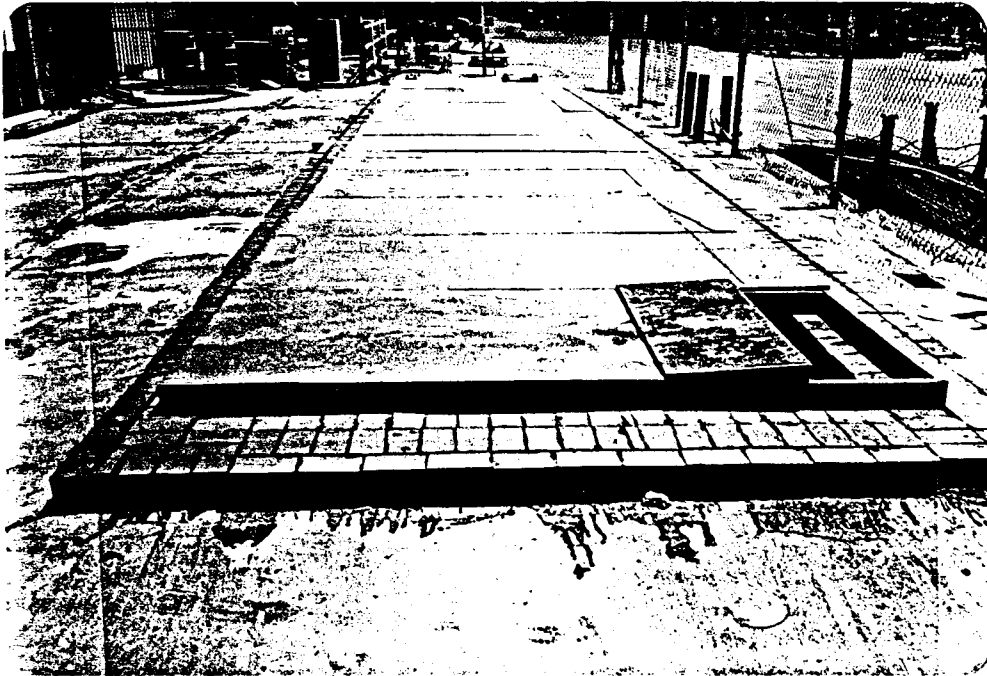
WASTE PAINT DRUMS
6-2-86



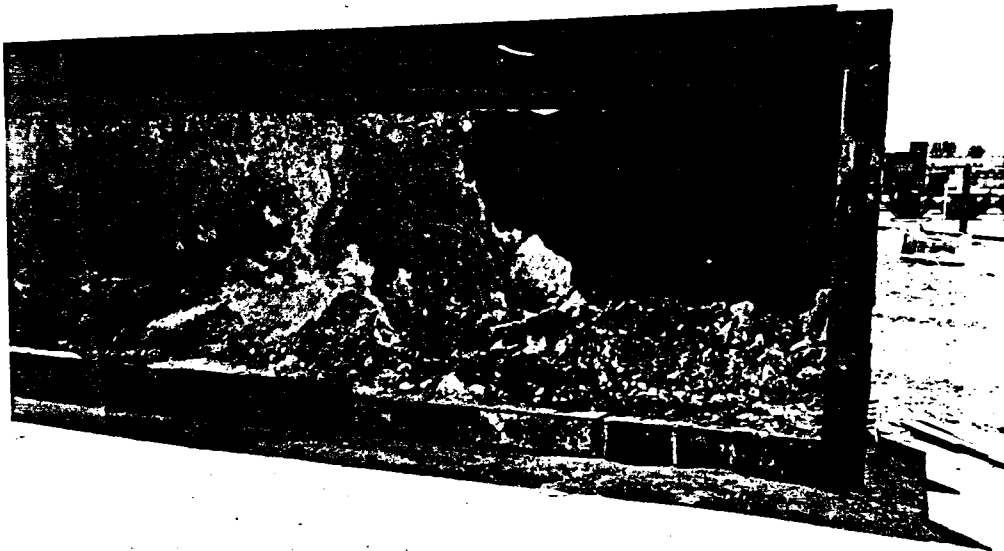
WASTE PAINT DRUMS
6-2-86



HAZARDOUS WASTE STORAGE AREA
WASTE SOLVENTS
6-2-86



SPENT ACID STORAGE TANK
6-2-86



SPENT ACID STORAGE TANK SLUDGE
6-2-86

SEP 19 1957

I, Mike Shaul Z. Son of 220 Garinz,
(Name of Driller) (Postoffice Address)

1. I am the driller of an irrigation well located on the S₁ Quarter, Section No. 5 Township 21 North, Range 54, owned by Artur Weinhold

whose postoffice address is P. O. Box 100 State of Nebraska

2. That the drilling was begun on the _____ day of August, 1955, and completed on the _____ day of August, 1955.

3. That the well is cased and screened in the following manner:

(Give kind of casing, length and location of screen)

screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is.....3/4.....inches.

5. That over-se Rotary type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows: xxx with 12" of 12" plain casing and

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

0	6	To soil
6	23	Blue sand and gravel
23	100	Broken (blue clay)

McCarty, Scotts Bluff, Co.

Signed Hogarth Drilling Co.

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

0	6	Top soil
6	23	Fine sand and gravel
23	100	Broken (Brule Clay)

Signed

Shaul & Son
Darryl P. Pank

Driller

Registration No. 9-15039 County of Scotts Bluff Date Filed DEC 4 1956

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

I, Midwest Farm Service of Gering
(Name of Driller) (Postoffice Address)

County of Scotts Bluff State of Nebraska, do hereby certify that:

1. I am the driller of an irrigation well located on the NW Quarter, Section No. 24
Township 22 North, Range 55, owned by Owen A. Frank

whose postoffice address is Scottsbluff State of Nebraska

2. That the drilling was begun on the 15th day of July, 1955, and completed on
the 16th day of July, 1955

3. That the well is cased and screened in the following manner: 20' of
18" 10 gauge plain casing
(Give kind of casing, lengths and position of plain and
40' 18" 10 gauge perforated casing
screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is 32 inches.

5. That reverse rotary type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows:

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

DEPTH IN FEET FROM	TO	MATERIAL DRILLED
0	6	Soil
6	15	Sand and gravel (light)
15	30	Gravel
30	45	Gravel
45	57	Gravel
57	75	Brule and layers of clay

21-201-571 Scotts Bluff County

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

I, _____ of _____
(Name of Driller) (Postoffice Address)

County of _____ State of _____, do hereby certify that:

1. I am the driller of an irrigation well located on the 12 Quarter, Section No. 17
Township 22 North, Range 5, owned by John F. Smith, Jr.

whose postoffice address is _____ State of _____

2. That the drilling was begun on the.....day of....., 19....., and completed on the.....day of....., 19......

3. That the well is cased and screened in the following manner:.....
 (Give kind of casing, lengths and position of plain and
 screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is.....inches.

5. That _____ type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows:.....

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

Well drilled in 1940 . Unable to locate well driller.

Date Signed.....

Registration No. A21006 County of Scotts Bluff Date Filed Sept. 22, 1960

**STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER**

I, Edward William Co. of Seattle
(Name of Driller) (Postoffice Address)

County of Polk State of Iowa, do hereby certify that:

1. I am the driller of an irrigation well located on the _____ Quarter, Section No. _____
Township _____ North, Range _____, owned by _____

whose postoffice address is _____ State of _____

2. That the drilling was begun on the _____ day of _____, 19____, and completed on the _____ day of _____, 19_____.

3. That the well is cased and screened in the following manner: _____
 _____ (Give kind of casing, lengths and position of plain and

 _____ screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is.....inches.

5. That _____ type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows: _____

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

[illegible]

Date Signed 9/26/60 Ray and Drilling Co.

Date Recd.

of P.O. Box 157, Gering
(Postoffice Address)

1. I am the driller of an irrigation well located on the 14th Quarter, Section No. 13
Township 22 North, Range 54, owned by W. B. [unclear]

2. That the drilling was begun on the 13 day of February, 1961, and completed on the 14 day of February, 1961.

60' 16" 10 gauge perforated casing
screen casing, weight of metallic casing, etc.)

5. That reverse rotary type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows:

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

0 36 5011

.....36..... 112..... Gravel

112 118 Clay

Date Signed.....**June 21, 1961**

By Floyd Hayden

MIDWEST FARM SERVICE

(If more space is required please use reverse side of this page)

Registration No. 21825 County of Scottsbluff Date Filed April 6, 1962

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, Mary H. Emery of Minatare
(Name of Person registering well) (Postoffice Address)

County of Scottsbluff State of Nebraska, being first duly sworn upon my oath say:

1st. That the name of the owner of the land upon which the irrigation well is located is

_____, of _____ Street, _____ County of _____
(City or Village)

2nd. That the irrigation well is located on the S.E. Quarter of the 71.2 Quarter of Section 13
Township 22 Range 54 of the Sixth P. M., Scottsbluff County, and is 72
feet from the East line and 21 feet from the North line of said tract.

3rd. That the well was installed with the intention of irrigating all or parts of the following described
land: Part of the 71.2¹/₄ and part of the S.E.¹/₄ and part of the S.W.¹/₄
of Section 13. T22R54, lying north of the Farmers
Irrigation Canal and South of the Pathfinder Irrigation
District Lateral
amounting in all to approximately 1.64 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 2200 gallons per minute.

5th. That the depth of the well is 118 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 16 inches.

7th. That the static water level in the well is 36 feet below ground surface.

8th. That the depth to water under normal pumping conditions is 46 feet below ground
surface. (Pumping Level)

9th. That the diameter of the pump column is 10 inches. That the diameter of the 2 stage
bowl or bowls is 12 inches. (Give number of bowls)

10th. That the type and size of impeller is as follows:

12" FHM Bowl

11th. That the well was completed on or about the 14 day of February 19 61

13-22N-54W, Scottsbluff County

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, John L. Schaneman and Walter Schaneman of Rt 2, Scottsbluff Nebr
(Name of Person registering well) (Postoffice Address)

County of Scotts Bluff State of Nebraska, being first duly sworn upon my oath say:

1st. That the name of the owner of the land upon which the irrigation well is located is John L. Schaneman & Walter Schaneman, of Rt 2 Street, Scottsbluff County of Scotts Bluff
(City or Village)
State of Nebraska

2nd. That the irrigation well is located on the SW Quarter of the SW Quarter of Section 14
Township 22 North, Range 54 West of the Sixth P. M., Scotts Bluff County, and is 968
feet from the West line and 1287 feet from the South line of said tract.

3rd. That the well was installed with the intention of irrigating all or parts of the following described
land: SW $\frac{1}{4}$ and SE $\frac{1}{4}$, or that part of said description south of Farmers Canal, Section 14
(Give Quarter, Section, Township and Range)
Township 22 North, Range 54, West 6th P. M.,

amounting in all to approximately 223 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 1000 gallons per minute.

5th. That the depth of the well is 100 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 16 inches.

7th. That the static water level in the well is 50 feet below ground surface.

8th. That the depth to water under normal pumping conditions is 65 feet below ground
surface. (Pumping Level)

9th. That the diameter of the pump column is 8 inches. That the diameter of the -2-
(Give number of bowls)
bowl or bowls is _____ inches.

10th. That the type and size of impeller is as follows:

Pomona 3" pump, 2 stages, numbers not available on pump, bowl and impeller

11th. That the well was completed on or about the 1st day of June, 1940

14-22N-54W, Scotts Bluff County

33-6 x .75

PROJECT NO. S-972(1)

EXAMINED BY L. P. Wenzl

22 FEET Lt. OF STA 8+32

COUNTY Scottsbluff

STATE OF NEBRASKA
DEPARTMENT OF ROADS
BRIDGE DESIGN SECTION

17, 20, 29, 30

STATE OF NEBRASKA
DEPARTMENT OF ROADS
BRIDGE DESIGN SECTION

2230, 24W + C 117, 100

[illegible]

SUMMARY OF TEST BORINGS

PROJ. LOCATION Scottsbluff East DATE 8-7-68 PROJECT NO. S-972(1)
 SEC. LOCATION SW-SW-SE-19-22-54W HOLE NO. 4 EXAMINED BY L. P. Wenzl
 WATER LEVEL 11.6' AFTER Caved ELEV. 3876.9 21.5 FEET Lt. OF STA 9+32
 STRUCTURE Winter Cr. COUNTY Scottsbluff

[illegible]

S-361X

SUMMARY OF TEST BORINGS
Hole 1 of 2 holes.

Project no. F-235(13)County Scottsbluff-Winter Cr. & CB&NExamined by L. P. WenzlDate 10-5-50

22-34-30ac

Station	Hole No.	Can No.	Depth	Remarks
5' <i>RT of</i>	1	Elev. = 3871.2	0'-5'	Topsoil: silt, black.
STs 229+18			5'-8'	Sand, fine, silty.
			8'-10'	Sand, clean, medium.
			10'-19'	Sand & gravel, clean, texture grades from medium sand to very coarse gravel, contains small stones.
			19'-30'	Gravel, clean, texture grades from medium sand to medium-fine gravel.
			30'-38'	Gravel, clean, texture grades from medium sand to coarse gravel.
			38'-41'	Sand, fine, clean.
			41'-59'	Sand, clean, texture grades from medium sand to medium-coarse gravel.
			59'-75'	Sand, clean, fine to medium-coarse.
			8.2'	Hole caved.

S-361X

SUMMARY OF TEST BORINGS
Hole 2 of 2 holes.

Project no. F-236(13)Examined by L. P. WenzlCounty Scottsbluff-Winter Cr. & CB&QDate 10-4-50

22-34-30ac

Station	Hole No.	Can No.	Depth	Remarks
6' 27.07	2	Elev. = 3859.1	0'-3'	Topsoil, black.
27 230+51			3'-7'	Sand, very slightly silty, fine to very coarse, contains tiny stones below 5'.
			7'-11'	Sand, clean, medium-coarse.
			11'-15'	Gravel, clean, texture grades from medium sand to very coarse gravel, contains tiny stones.
			15'-20'	Sand, clean, fine to medium.
			20'-24'	Sand, clean, texture grades from fine sand to medium-fine gravel.
			24'-32'	Gravel, clean, texture grades from medium sand to medium gravel.
			32'-43'	Sand, clean, fine, contains coarse sand.
			43'-52'	Sand, clean, texture grades from medium sand to medium-fine gravel, contains few tiny stones.
			52'-63'	Sand, clean, fine to coarse.
			63'-75'	Sand, clean, fine to medium-fine.

6.4' Hole caved.

Registration No. G-31537 County of Scotts Bluff Date Filed June 25, 1969

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, Willis D. Ross of 1903 10th Gering
(Name of Person registering well) (Postoffice Address)

County of Scotts Bluff State of Nebraska, do hereby certify:

1st. That the name of the owner of the land upon which the irrigation well is located is Willis D. Ross, of 1903 10th Street, Gering County of Scotts Bluff State of Nebraska
(City or Village)

2nd. That the irrigation well is located on the NE Quarter of the 1/4 Quarter of Section 51 Township 21N, Range 55W of the Sixth P. M., Scotts Bluff County, and is 400 feet from the West line and 20 feet from the South line of said tract.

3rd. That the well was installed with the intention of irrigating all or parts of the following described land: South half of NE quarter of section 51 Township 21 North Range (55) west of the Sixth principal meridian
(Give Quarter, Section, Township and Range)
amounting in all to approximately 12 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 400 gallons per minute.

5th. That the depth of the well is 60 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 12 1/2 inches.

7th. That the static water level in the well is 10 feet below ground surface.

8th. That the depth to water under normal pumping conditions is 50 feet below ground surface.
(Pumping Level)

9th. That the diameter of the pump column is 6 inches. That the diameter of the 1 bowl or bowls is 12 inches.
(Give number of bowls)

10th. That the type and size of impeller is as follows:

Vinthroat 12-352

11th. That the well was completed on or about the 10 day of June, 1968.

**STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER**

I, Midwest Farm Service, Inc. of P. O. Box 366, Gering
(Name of Driller) (Postoffice Address)

County of Scotts Bluff State of Nebraska, do hereby certify that:

1. I am the driller of a well located on the NE 1/4 Quarter, Section No. 51
Township 21 North, Range 55W, owned by W. H. D. Ross
whose postoffice address is 1905-10th, Spring State of Nebraska.

2. That the drilling was begun on the.....².....day of.....March....., 19⁶⁸, and completed on the.....².....day of.....March....., 19⁶⁸.

3. That the well is cased and screened in the following manner: 20' 12 3/4" 10 ga. plain,
(Give kind of casing, lengths and position of plain and
40' 12 3/4" 1 ga. perf. casing
screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is 1 1/2 inches.

5. That reverse rotary type of drilling machinery was used.

6. That the drilled hole ~~is~~/is not sealed, as follows:.....

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

DEPTH IN FEET		MATERIAL DRILLED
FROM	TO	
0	2	Soil
2	20	Soft sticky clay & brule
20	40	M.S. & F.G. & N.C.
40	50	Green clay
50	60	Grey clay, some broken brule with stain

HIGHEST FARM SERVICE, INC.

Date Signed 8/17/68

Registration No. _____ County of _____ Date Filed _____

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, Ray Herpel of SEILING
(Name of Person registering well) (Postoffice Address)

County of Scottsbluff State of Nebraska, do hereby certify:

1st. That the name of the owner of the land upon which the irrigation well is located is Ray

Herpel of G. F. 2nd Street, Gering County of Scottsbluff
(City or Village)

State of Nebraska

2nd. That the irrigation well is located on the _____ Quarter of the _____ Quarter of Section 5

Township 47, Range 54th of the Sixth P. M., S. B. County, and is

feet from the _____ line and _____ feet from the _____ line of said tract.

3rd. That the well was installed with the intention of irrigating all or parts of the following described

land: PT 1/4 NE 4 N 16 1/2 - 21 - 27
(Give Quarter, Section, Township and Range)

amounting in all to approximately 80 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 100 gallons per minute.

5th. That the depth of the well is _____ feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is _____ inches.

7th. That the static water level in the well is _____ feet below ground surface.

8th. That the depth to water under normal pumping conditions is _____ feet below ground
surface. (Pumping Level)

9th. That the diameter of the pump column is _____ inches. That the diameter of the
bowl or bowls is _____ inches. (Give number of bowls)

10th. That the type and size of impeller is as follows:

11th. That the well was completed on or about the _____ day of _____, 19_____

12th. That attached hereto are three copies of the log of the well certified to by the driller of the well.

13th. That the driller of this well is....., whose address is.....

14th. That the name of the tenant or operator, if other than the owner, is.....
....., whose address is.....

15th. That the relation which the subscriber to this instrument bears to said registrant is that of

owner
(State whether owner, tenant or agent for land on which well is located)

and that he is authorized to sign this instrument in behalf of the interest affected.

Signed:.....

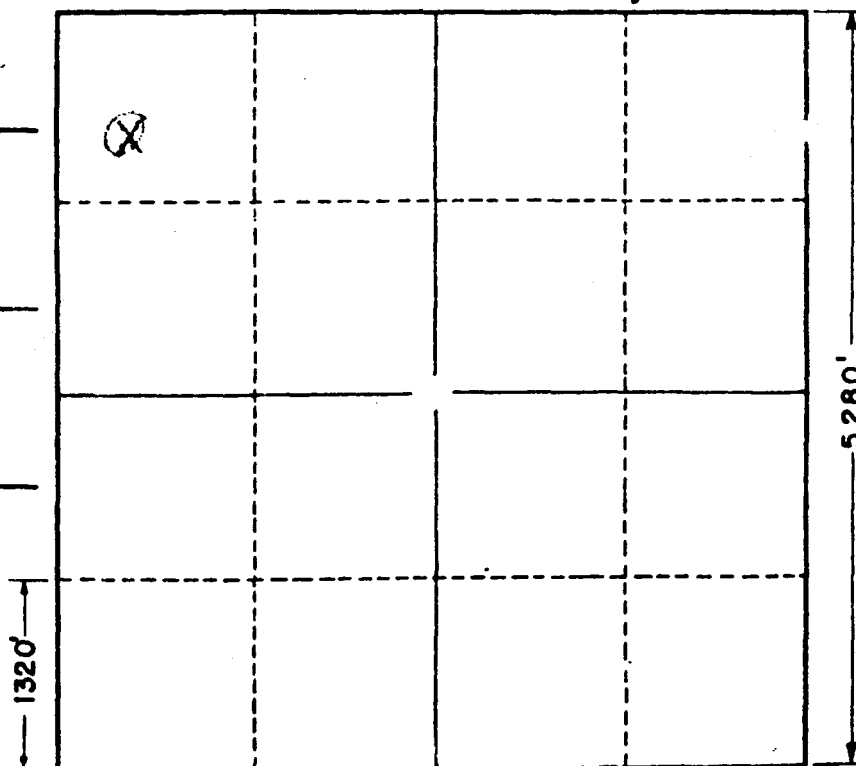
Dated:.....

This drawing represents one Section
Mark with an "X" the location of the irrigation well

Section No. 5

Township 1

Range 24



Each small subdivision is a 40-acre tract.

State of Nebraska

Department of Water Resources

} ss.

This instrument was filed for record at 10 o'clock..... M., on the 20th day of January 1974...

Donald Jones Jr.
Director of Water Resources

Registration No. C-22437 County of San Diego Date Filed January 27, 1974

**STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER**

I, _____ of _____
(Name of Driller) (Postoffice Address)

County of San Diego State of California, do hereby certify that:

1. I am the driller of a well located on the.....Quarter, Section No.....
Township.....North, Range....., owned by.....
whose postoffice address is.....State of.....

2. That the drilling was begun on the 7 day of July, 1942, and completed on the 7 day of July, 1942.

3. That the well is cased and screened in the following manner: 5" pipe - 100' - 10" casing
(Give kind of casing, lengths and position of plain and
screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is.....inches.

5. That Electric type of drilling machinery was used.

6. That the drilled hole is/is not sealed, as follows: Sealed with cement

7. That the following is an accurate log of the depth, thickness and character of the different strata penetrated, and the location of water-bearing strata:

[illegible]

Date Signed 12/1/73

Dr. 131

Registration No. 9-4672 County of Scotts Bluff Date Filed May 12, 1975

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, ARTHUR WEINHOLD of GERING 69.341
(Name of Person registering well) (Postoffice Address)

County of SCOTTS BLUFF State of NEBRASKA, do hereby certify:

1st. That the name of the owner of the land upon which the irrigation well is located is ARTHUR WEINHOLD, of ROUTE #1 Street, GERING County of SCOTTS BLUFF
(City or Village)
State of NEBRASKA

2nd. That the irrigation well is located on the NW Quarter of the SW Quarter of Section X5 Township 9N, Range 54E of the Sixth P. M., Scotts Bluff County, and is 450 feet from the WEST line and 910 feet from the NORTH line of said tract.

3rd. That the well was installed with the intention of irrigating all or parts of the following described land: S 1/2 of Sec. 5-21-54
(Give Quarter, Section, Township and Range)

amounting in all to approximately 145 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 500 gallons per minute.

5th. That the depth of the well is 85 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 15 inches.

7th. That the static water level in the well is 13 feet below ground surface.

8th. That the depth to water under normal pumping conditions is 44 feet below ground surface.
(Pumping Level)

9th. That the diameter of the pump column is 6 inches. That the diameter of the 6 bowl or bowls is 10 CS inches.
(Give number of bowls)

10th. That the type and size of impeller is as follows:

Johnston Turbine 6 stage 10 CS bowl

11th. That the well was completed on or about the 5 day of April, 1975.

S. 5, T. 21N., R. 54W., Scotts Bluff Co.

12th. That attached hereto are three copies of the log of the well certified to by the driller of the well.

13th. That the driller of this well is Midwest Farm Service, Inc., whose address is

P. O. Box 366 Gering, NE 68341

14th. That the name of the tenant or operator, if other than the owner, is

_____, whose address is _____

15th. That the relation which the subscriber to this instrument bears to said registrant is that of

Owner

(State whether owner, tenant or agent for land on which well is located)

and that he is authorized to sign this instrument in behalf of the interest affected.

Signed: Arthur Winhold

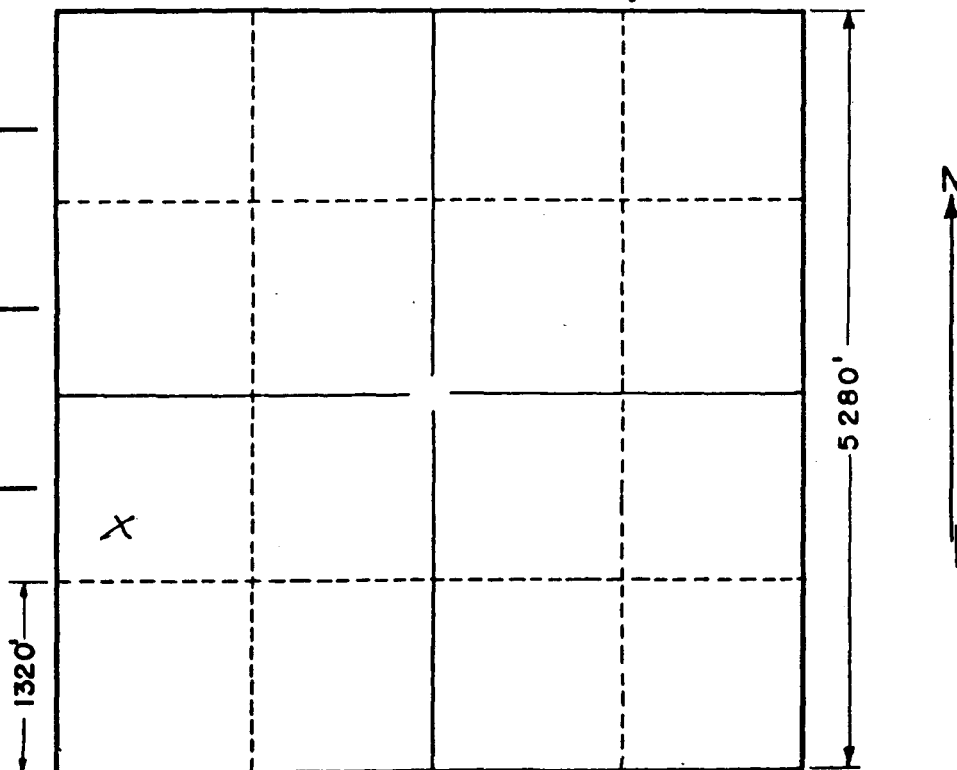
Dated: May 9, 1975

This drawing represents one Section
Mark with an "X" the location of the Irrigation well

Section No. 5

Township 21

Range 54



Each small subdivision is a 40-acre tract.

State of Nebraska

Department of Water Resources

} ss.

This instrument was filed for record at 10 o'clock A. M., on the 10 day of May 1975.

M.E. Ball
Director of Water Resources km

SUMMARY OF TEST BORINGS

LOCATION Scottsbluff East DATE 2-4-75 PROJECT NO. S-1013(3)
 LOCATION NW-NW-SW-31-22-54W HOLE NO. 1* EXAMINED BY L. C. Little
 WATER LEVEL 6.1' AFTER Caved ELEV. 3863.2 FT. 0 STA 58+07.8
 STRUCTURE North Platte River COUNTY Scotts Bluff

[illegible]

PROJ. LOCATION Scottsbluff East DATE 3-25-75 PROJECT NO. S-1013(3)
 SEC. LOCATION SW-NW-31-22-54W HOLE NO. 1 EXAMINED BY L. P. Wenzl
 WATER LEVEL 3.9' AFTER Caved ELEV. 3861.6 5 FT. Rt. STA 61+12
 STRUCTURE North Platte River COUNTY Scotts Bluff

[illegible]

SUMMARY OF TEST BORINGS

PROJ. LOCATION Scottsbluff East DATE 3-25-75 PROJECT NO. S-1013(3)

SEC. LOCATION SW-NW-31-22-54W HOLE NO. 2 EXAMINED BY L. P. Wenzl

WATER LEVEL 3.8' AFTER Caved ELEV. 3861.3 4 FT. Rt. STA 63+20

STRUCTURE North Platte River COUNTY Scotts Bluff

STATE OF NEBRASKA
DEPARTMENT OF ROADS
BRIDGE DESIGN SECTION[illegible]

SUMMARY OF TEST BORINGS

PROJ. LOCATION Scottsbluff East DATE 3-25-75 PROJECT NO. S-1013(3)
 SEC. LOCATION SW-NW-31-22-54W HOLE NO. 3 EXAMINED BY L. P. Wenzl
 WATER LEVEL 4.1' AFTER 5 Min. ELEV. 3861.5 1 FT. Lt. STA 65+10
 STRUCTURE North Platte River COUNTY Scotts Bluff

STATE OF NEBRASKA
DEPARTMENT OF ROADS
BRIDGE DESIGN SECTION[illegible]

SUMMARY OF TEST BORINGS

PROJ. LOCATION Scottsbluff East DATE 3-25-75 PROJECT NO. S-1013(3)
SEC. LOCATION SE-NE-36-22-55W HOLE NO. 4 EXAMINED BY L. P. Wenzl
WATER LEVEL 1.1' AFTER 5 Min. ELEV. 3858.8 FT. STA West end of island
STRUCTURE North Platte River COUNTY Scotts Bluff

[illegible]

SUMMARY OF TEST BORINGS

PROJ. LOCATION Scottsbluff East DATE 3-25-75 PROJECT NO. S-1013(3)
SEC. LOCATION SW-NW-3'-22-54W HOLE NO. 5 EXAMINED BY L. P. Wenzl
WATER LEVEL 0.7' AFTER 5 Min. ELEV. 3857.3 FT. East end of STA island
STRUCTURE North Platte River COUNTY Scotts Bluff

[illegible]

Registration No. E-4077 County of Scotts Bluff Date Filed May 10, 1975

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

I, Midwest Farm Service, Inc. of P. O. Box 366 Gering
(Name of Driller) (Postoffice Address)

County of Scotts Bluff State of Nebraska, do hereby certify that:

1. I am the driller of a well located on the Southwest Quarter, Section No. 5
Township 21 North, Range 54, owned by ARTHUR WEINHOLD
whose postoffice address is GERING 69341 State of NEBRASKA
2. That the drilling was begun on the 12 day of February, 1975, and completed on
the 12 day of February, 1975.
3. That the well is cased and screened in the following manner: 0-12' 10 in. 1 1/2" Plain; 12-
27' 10 in. 1 1/2" Chisel Perf.; 27-85' Open Hole.
(Give kind of casing, lengths and position of plain and
screen casing, weight of metallic casing, etc.)
4. That the diameter of drilled hole is 1 1/2 inches.
5. That reverse rotary type of drilling machinery was used.
6. That the drilled hole is/is not sealed, as follows: 0-14' cemented 2 1/2" CMF

7. That the following is an accurate log of the depth, thickness and character of the different strata
penetrated, and the location of water-bearing strata:

DEPTH IN FEET		MATERIAL DRILLED
FROM	TO	
<u>0</u>	<u>10</u>	<u>Soft sandy clay</u>
<u>10</u>	<u>20</u>	<u>Sand</u>
<u>20</u>	<u>32</u>	<u>Broken brule, water marks</u>
<u>32</u>	<u>40</u>	<u>Firm Brule</u>
<u>40</u>	<u>50</u>	<u>Firm brule</u>
<u>50</u>	<u>85</u>	<u>Brule w/loose area</u>

Date Signed April 30, 1975

MIDWEST FARM SERVICE, INC.

Driller

Registration No. E-52203 County of Scotts Bluff Date Filed 12-1-76

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, Rider Drilling, Inc of Box 357 Rundell Road Industrial Tract, Gering
(Name of Person registering well) (Postoffice Address) Nebraska

County of Scotts Bluff State of Nebraska, do hereby certify:

1st. That the name of the owner of the land upon which the irrigation well is located is.....

Rider Drilling, Inc of Rundell Road Box 357 Street, Gering County of Scotts Bluff
(City or Village)

State of Nebraska

Block Q Gering Industrial Tracts

2nd. That the irrigation well is located on the N¹ N.E. Quarter of the N.E. Quarter of Section 1

Township 21 North Range 55 West of the Sixth P. M., Scotts Bluff County, and is 75

feet from the east line and 6 feet from the North line of said tract.

3rd. That the well was installed with the intention of **overhead loading** ~~irrigation~~ all or parts of the following described

land: N¹ of N.E. 1, Sec One (1) T. Twenty One (21) North, Range Fifty -Five (55)
(Give Quarter, Section, Township and Range)

West of the 6th P.M. Block "Q" Gering Industrial Tracts, Subdivision

amounting in all to approximately 2 acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached hereto.)

4th. That the capacity of said well under normal operating conditions is 250 gallons per minute.

5th. That the depth of the well is 57 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 6 5/8 inches.

7th. That the static water level in the well is 12 feet below ground surface

8th. That the depth to water under normal pumping conditions is feet below ground surface.
(Pumping Level)

9th. That the diameter of the pump column is inches. That the diameter of the
(Give number of bowls)
bowl or bowls is inches.

10th. That the type and size of impeller is as follows:

11th. That the well was completed on or about the day of, 19.....

SCOTTS BLUFF CO., Sec. 1, T. 21N., R. 55W.

12th. That attached hereto are three copies of the log of the well certified to by the driller of the well.

13th. That the driller of this well is Rider Drilling, Inc., whose address is

Box 357 Gering, Nebraska 69341

14th. That the name of the tenant or operator, if other than the owner, is.....

....., whose address is.....

15th. That the relation which the subscriber to this instrument bears to said registrant is that of

owner
(State whether owner, tenant or agent for land on which well is located)

and that he is authorized to sign this instrument in behalf of the interest affected.

Signed:.....

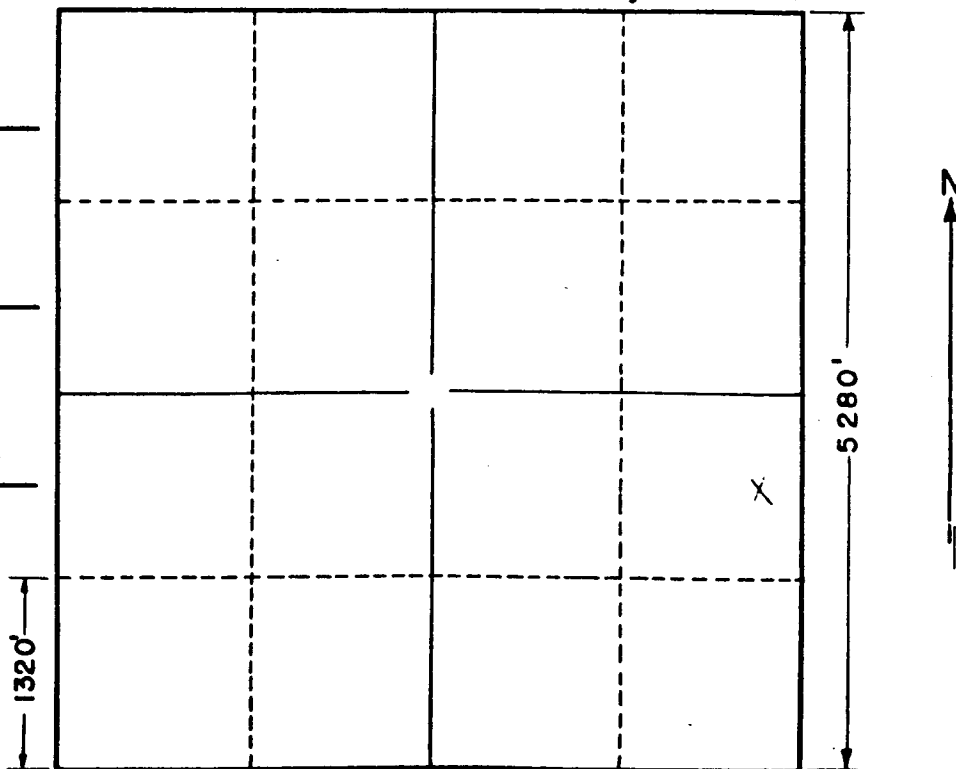
Dated: Nov. 15, 1976

This drawing represents one Section
Mark with an "X" the location of the Irrigation well

Section No. 1

Township 21

Range 55



Each small subdivision is a 40-acre tract.

State of Nebraska

Department of Water Resources

} ss.

This instrument was filed for record at 10 o'clock A. M., on the 3rd day of December, 1976.

Marion E. Ball

Director of Water Resources

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

County of Scotts Bluff State of Nebraska, do hereby certify that:
Block "C" Caring Industrial Tracts / Subdivision of part

6. That the drilled hole is/is not sealed, as follows:.....

Date Signed..... Nov 15, 1976.....

Gering Industrial Well No. 1

Registration No. G-56972

County

Scotts Bluff

Date Filed

6-29-77

STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner:

City of Gering
Gering, Nebraska 69341☐ IRRIGATION☒ MUNICIPAL☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Shaul Drilling Co.
101 Terry Blvd.
Gering, Nebraska 69341

Location of the well:

(If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

NW Quarter of the SE Quarter of Section One (1), Township 21N, Range 55W

Scotts Bluff County. The well is 1400 feet from the East line and 720

feet from the South line of the section and is 4100 feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land: None

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: 1200 gallons per minute.
2. Total well depth: 338 feet.
3. Inside diameter of the casing: 16 inches.
4. Static (non-pumping) water level in the well: 16 feet below ground surface.
5. Depth of water under normal pumping conditions: 105 feet below ground surface.
6. Pump column: Diameter 8 inches. Length 150 feet.

The well was completed on or about November 19, 1976.

MORE ON BACK

MORE ON BACK

CALL OF GERING

Scottsbluff 21N 55W sec 1

April, 1976

Gering Industrial Well No. 1

Registration No. **G-56972** County **Scotts Bluff**

Date Filed **6-29-77**

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: **Shaul Drilling Co.**
101 Terry Blvd.
Gering, Nebraska 69341

Well Location:

North Platte

Natural Resources District

NW..... Quarter of the **SE**..... Quarter of Section **One (1)**., Township **21N**....., Range **55W**.....
Scotts Bluff..... County, and owned by **City of Gering, Nebraska.**

Drilling & construction specifications:

1. Date construction was begun: **November 18**....., 19**76**.....
2. Date construction was completed: **November 19**....., 19**76**.....
3. Diameter of the drilled hole: **24**..... inches.
4. Was the hole electronically logged? ☐ Yes ☒ No.
5. How is drilled hole sealed (not sealed)? **Gravel Packed with top welded on.**

6. Well casing & screen: **60 Ft. perforated, 40 ft. plain, 200 ft. perforated,**
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)
38 ft. plain -- 7 gauge metal casing, 10% louvre perforated

7. Is the well artificially gravel stabilized? ☒ Yes ☐ No

Pumping test information:

1. Pumping rate: **1550**... gallons per minute.
2. Depth to water before pumping: **16**..... feet.
3. Depth to water **230**..... feet after pumping **23**..... ~~minutes~~ **hours.**

DRILLING LOG ON BACK

DRILLING LOG ON BACK

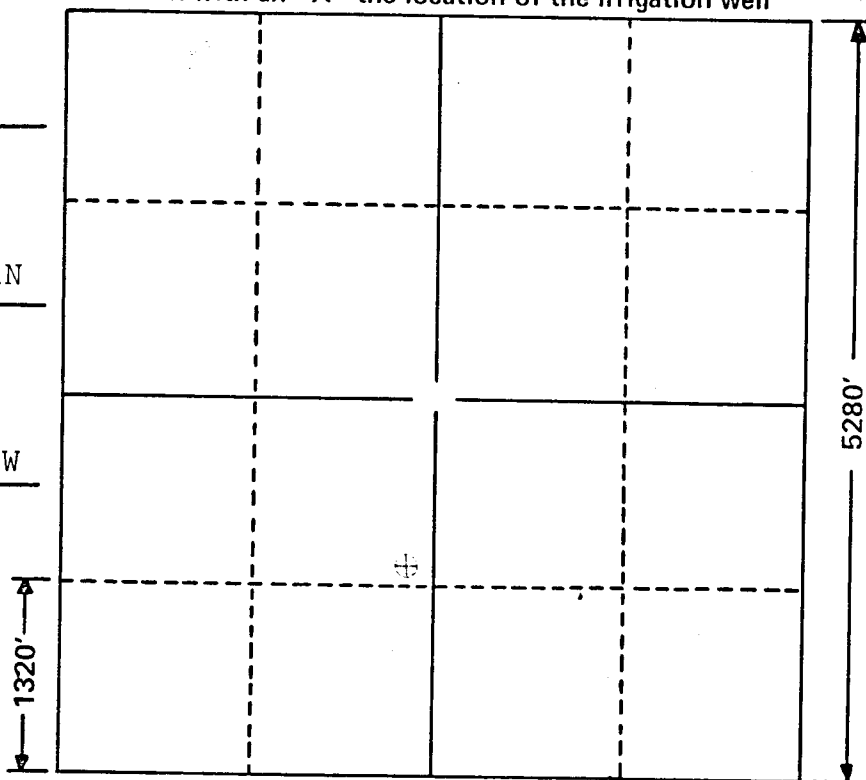
Filed April, 1976
Register

Mark with an "X" the location of the irrigation well

Section No. 1

Township 21N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

Ronald H. Liger
Well Owner's Signature

6-20-76
Date

DRILLING LOG

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

0	8	Top Soil	
8	12	Clay	
12	21	Silty Clay - Sand - Traces of Gravel	Casing
21	31	Sand, rock, pebbles -- Large Loose Gravel	
31	45	Large Sand, Rock -- Pebbles Open	38
45	50	Soft White Clay	Screen
50	60	Brule 30% Firm	60 338
60	67	Soft White Clay	Casing
67	74	Brule 40% Firm	
74	105	Brule - Gray in Color	100
105	125	Brule w/50% green sandrock	Screen
125	170	Sandy Green Clay	
170	195	Sandy White Clay	
195	205	Sandy Gray Clay	
205	225	Sandy Green Clay	
225	240	Sticky Green Clay	
240	270	Very Sticky Clay	338 Casing 273
270	296	Sticky Clay with sandstone ledges	300
296	305	Green Sandy Clay - Sandrock - Traces of coarse sand	
305	308	Sticky Clay and Gravel - Chadron Sand	
308	321	Large Gravel (green) - Chadron Sand	Screen
321	328	Green Clay - Chadron Sand	
328	334	Gravel and Sand - Chadron Sand	
334	337	Sticky gray shale	

Mike Shaul
Well Driller's Signature

6-28-77
Date

Registration No. G-57676 County **Scotts Bluff**Date Filed **May 25, 1977** ~~May 25, 1976~~ 3-8-STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner: **City of Gering**
Gering, Nebraska☐ IRRIGATION☒ MUNICIPAL☐ INDUSTRIAL
(Check One)Name & Address of well driller: **Unknown**

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22N, Range 55W

Scotts Bluff County. The well is 1570 feet from the East line and 1990

feet from the North line of the section and is 300 feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: 150 gallons per minute.
2. Total well depth: 65 feet.
3. Inside diameter of the casing: not known inches.
4. Static (non-pumping) water level in the well: not known feet below ground surface.
5. Depth of water under normal pumping conditions: not known feet below ground surface.
6. Pump column: Diameter not known inches. Length not known feet.
7. The well was completed on or about Unknown, 19....

MORE ON BACK

MORE ON BACK

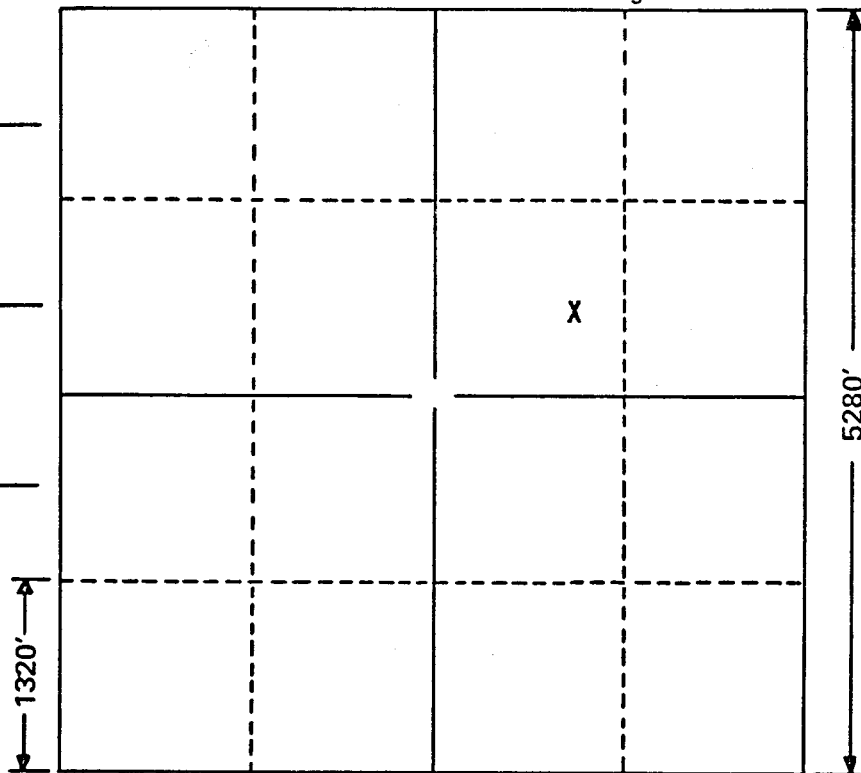
Well No. 2

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

AUG 6 1976
Date

Registration No. **G-57676** County **Scotts Bluff**

Date Filed **8-8-77**

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller:

UNKNOWN

Well Location:

NO INFORMATION AVAILABLE

..... Natural Resources District
SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Registration No. **G-57677** County **Scotts Bluff** Date Filed **5/25/77** ~~8-8-77~~

STATE OF NEBRASKA
WELL REGISTRATION

Is this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner: **City of Gering**
Gering, Nebraska

☐ IRRIGATION

☒ MUNICIPAL

☐ INDUSTRIAL
(Check One)

Name & Address of well driller: **Unknown**

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the **NE** Quarter of Section **35**, Township **22N**, Range **55W**

Scotts Bluff County. The well is **1120** feet from the **East** line and **1990**

feet from the **North** line of the section and is **225** feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **350** gallons per minute.
2. Total well depth: **65** feet.
3. Inside diameter of the casing: **not known** inches.
4. Static (non-pumping) water level in the well: **not known** feet below ground surface.
5. Depth of water under normal pumping conditions: **not known** feet below ground surface.
6. Pump column: Diameter **not known** inches. Length **not known** feet.
7. The well was completed on or about **Not known**, 19....

MORE ON BACK

MORE ON BACK

CALL OF BLIND

SCOTT BLUFF 22N 55W SEC 35

Well No. 3

Mark with an "X" the location of the irrigation well

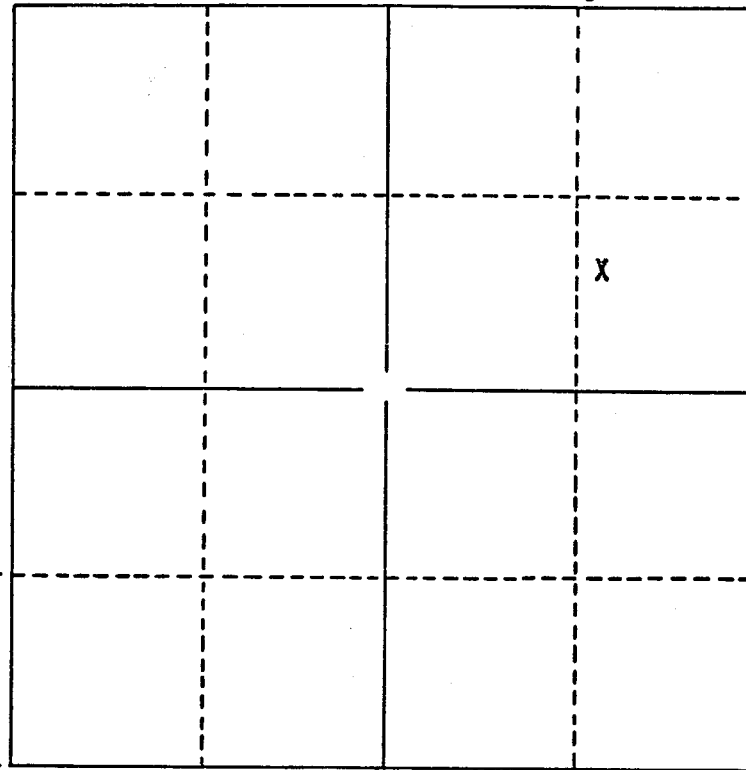
Section No. 35

22N

Township 22N

Range 55W

1320'



5280'



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

Well Owner's Signature

Date

April, 1976

Well No. 3

3

Registration No. G-57677

County

Scotts Bluff

Date Filed

8-3-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West

Scotts Bluff

City of Gering

..... County, and owned by

Drilling & construction specifications:

1. Date construction was begun:, 19

2. Date construction was completed:, 19

3. Diameter of the drilled hole: inches.

4. Was the hole electronically logged? ☐ Yes ☐ No.

5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.

2. Depth to water before pumping: feet.

3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Well No. 4

Registration No. **G-57678** County **Scotts Bluff**Date Filed **5/25/77** ~~8-8-77~~STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATION

Name & Address of well owner:

☒ MUNICIPAL**City of Gering**
Gering, Nebraska☐ INDUSTRIAL
(Check One)Name & Address of well driller: **Not known**

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the **NE** Quarter of Section **35**, Township **22N**, Range **55W****Scotts Bluff** County. The well is **100** feet from the **East** line and **3290**feet from the **South** line of the section and is **150** feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: **none**

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **400** gallons per minute.2. Total well depth: **62** feet.**not known**

3. Inside diameter of the casing: inches.

not known

4. Static (non-pumping) water level in the well: feet below ground surface.

not known

5. Depth of water under normal pumping conditions: feet below ground surface.

6. Pump column: Diameter **not known** inches. Length **not known** feet.7. The well was completed on or about **not known**, 19....

MORE ON BACK

MORE ON BACK

Well No. 4

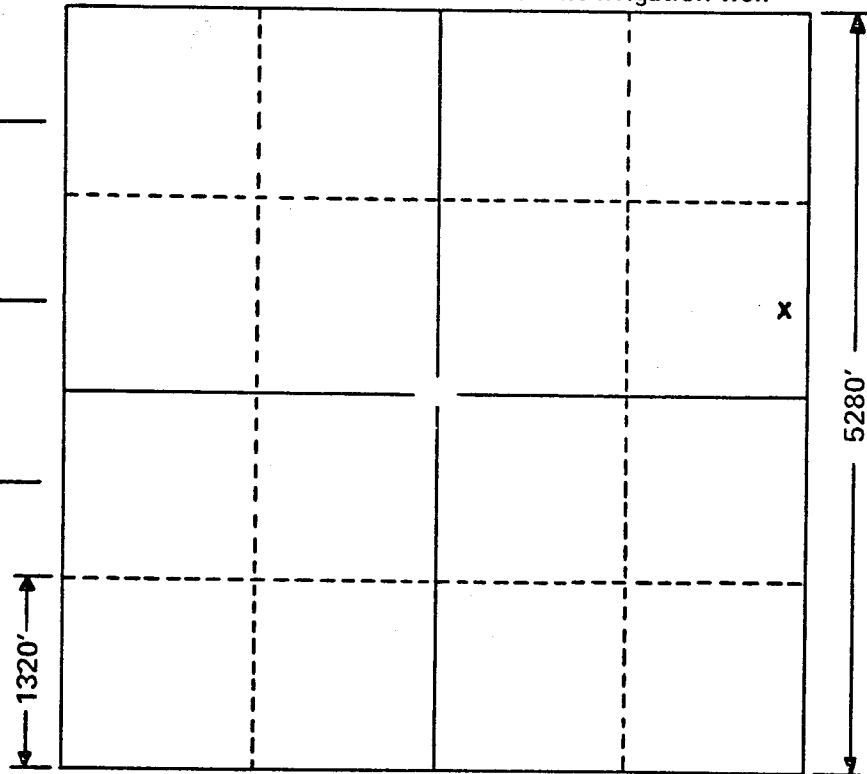
April, 1976
Registration No.

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

235 8 1977
Date

April, 1976

Well No. 4

3

Registration No. G-57678

County

Scotts Bluff

Date Filed 8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22, Range 85 West,
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?
6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)
7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Registration No. **G-57679** County **Scotts Bluff**Date Filed ~~07-3-77~~ **8-8-77**STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner:

**City of Gering
Gering, Nebraska**☐ IRRIGATION☒ MUNICIPAL☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Not known

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the **NE** Quarter of Section **35**, Township **22N**, Range **55W****Scotts Bluff** County. The well is **650** feet from the **East** line and **3290**feet from the **South** line of the section and is **175** feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **450** gallons per minute.
2. Total well depth: **60** feet.
3. Inside diameter of the casing: **unknown** inches.
4. Static (non-pumping) water level in the well: **unknown** feet below ground surface.
5. Depth of water under normal pumping conditions: **unknown** feet below ground surface.
6. Pump column: Diameter **unknown** inches. Length **unknown** feet.
7. The well was completed on or about **unknown**, 19.....

MORE ON BACK

MORE ON BACK

Registration
April 1961

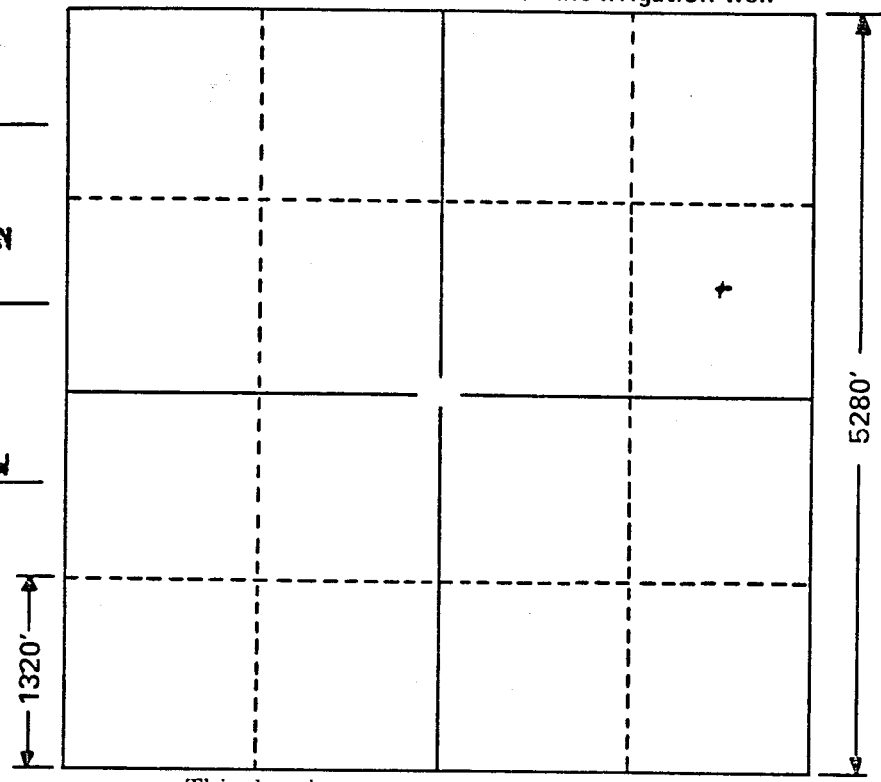
Well No. 7

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

AUG 6 1977
Date

Station No. G-57679

County

Scotts Bluff

Date Filed

8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West,

Scotts Bluff County, and owned by City of Cering

Drilling & construction specifications:

1. Date construction was begun:, 19

2. Date construction was completed:, 19

3. Diameter of the drilled hole: inches.

4. Was the hole electronically logged? ☐ Yes ☐ No.

5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.

2. Depth to water before pumping: feet.

3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Well No. 8

Registration No. G-375 County Scotts Bluff Date Filed May 25, 1977 3-8-77STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATION

Name & Address of well owner:

City of Gering
Gering, Nebraska☒ MUNICIPAL☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Unknown

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22N, Range 55WScotts Bluff County. The well is 360 feet from the East line and 3290feet from the South line of the section and is 100 feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: None

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: 400 gallons per minute.
2. Total well depth: 62 feet.
3. Inside diameter of the casing: unknown inches.
4. Static (non-pumping) water level in the well: unknown feet below ground surface.
5. Depth of water under normal pumping conditions: unknown feet below ground surface.
6. Pump column: Diameter unknown inches. Length unknown feet.
7. The well was completed on or about Unknown, 19....

MORE ON BACK

MORE ON BACK

CITY OF GERING

SCOTTS BLUFF

JUN 30 1977

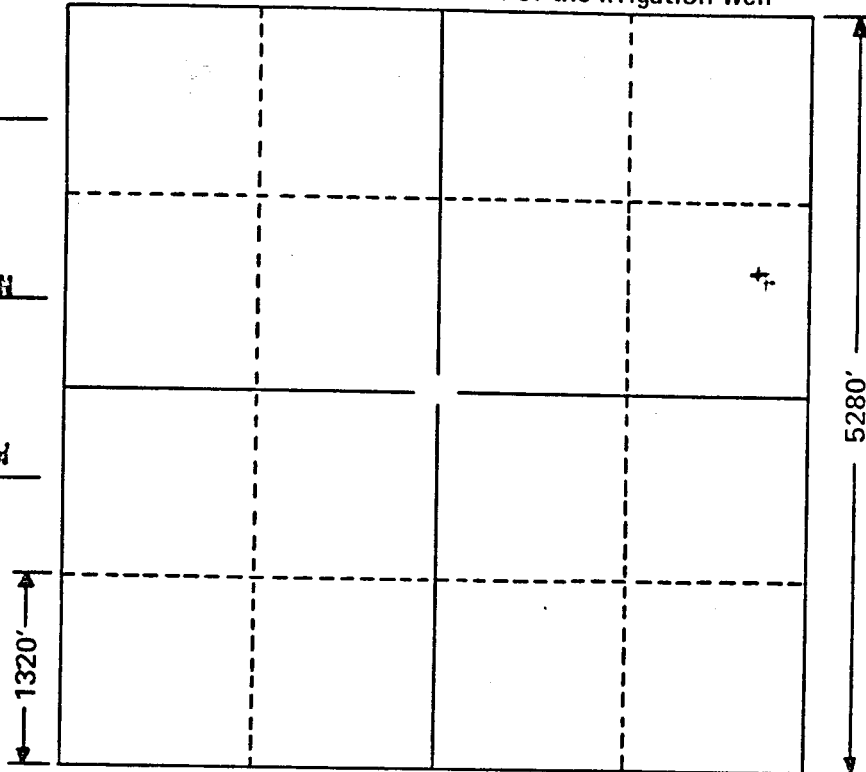
WELL No. 8

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature] AUG 5 1977
Well Owner's Signature Date

April, 1976

Well No. 8

3

Registration No. G-57680

County

Scotts Bluff

Date Filed

8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District
SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19.....
2. Date construction was completed:, 19.....
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?
6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)
7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Revised April, 1976

Well No. 9

Registration No. **G-57601** County **Scotts Bluff** Date Filed **5/25/77** 8-9-77STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATIONName & Address of well owner: **City of Gering**
Gering, Nebraska☒ MUNICIPAL☐ INDUSTRIAL
(Check One)Name & Address of well driller: **not known**

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte Natural Resources District
(Give Name)**E** Quarter of the **NE** Quarter of Section **35** Township **22N** Range **55W****Scotts Bluff** County. The well is **650** feet from the **East** line and **3540**feet from the **South** line of the section and is **150** feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **400** gallons per minute.
2. Total well depth: **61** feet.
3. Inside diameter of the casing: **unknown** inches.
4. Static (non-pumping) water level in the well: **unknown** feet below ground surface.
5. Depth of water under normal pumping conditions: **unknown** feet below ground surface.
6. Pump column: Diameter inches. Length **unknown** feet.

The well was completed on or about **unknown** , 19.....

MORE ON BACK

MORE ON BACK

CITY OF GERING

SCOTTS BLUFF 22N 55W SEC

April, 1976

Well No. 9

3

Registration No. G-57681 County

Scotts Bluff

Date Filed 8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West

Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

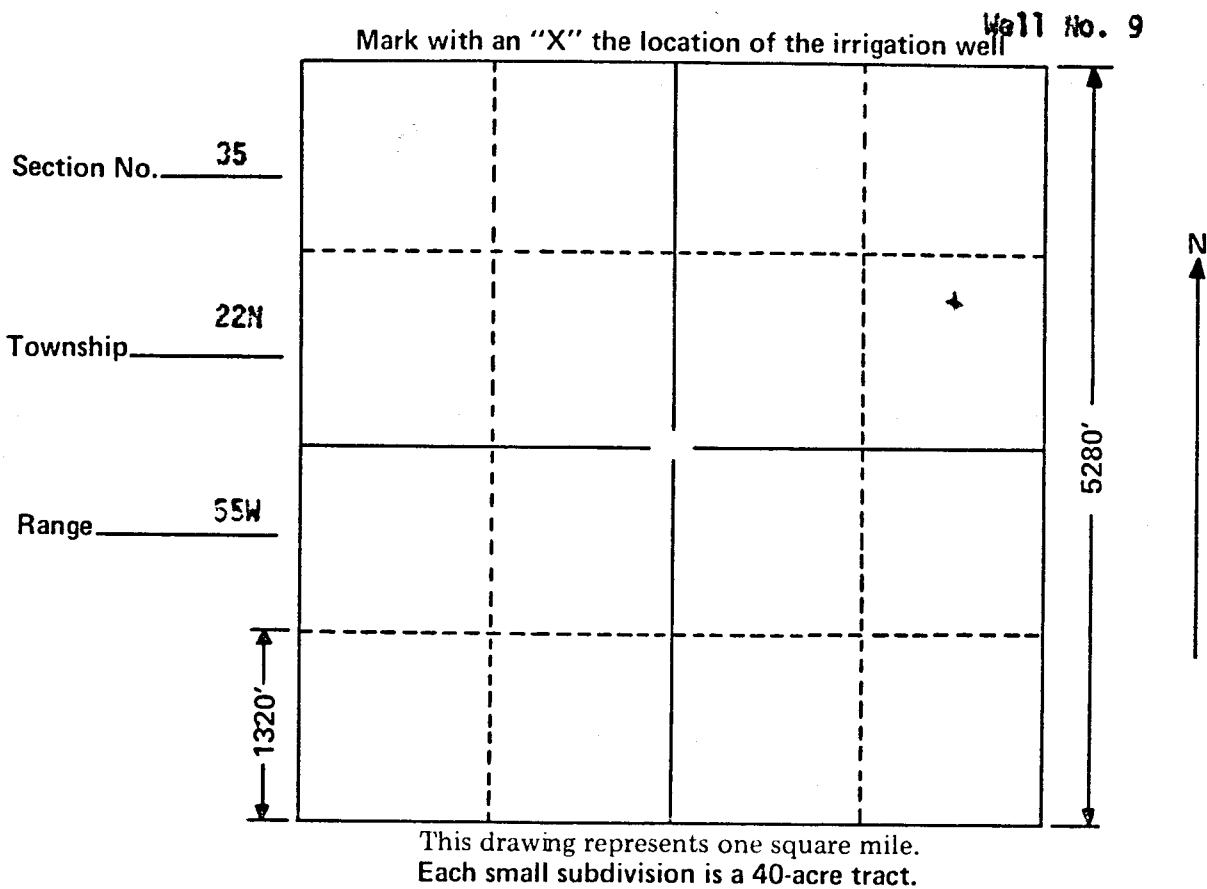
Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Additional
Irrigation



I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

AUG 5 1977
Date

Well No. 10

Registration No. G-57682 County Scotts Bluff Date Filed 5/25/77 ~~8-8-77~~STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner: City of Gering
Gering, Nebraska☐ IRRIGATION☒ MUNICIPAL☐ INDUSTRIAL
(Check One)Name & Address of well driller: not known

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22N, Range 55WScotts Bluff County. The well is 570 feet from the East line and 3470feet from the South line of the section and is 100 feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: None

(Give Quarter, Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: 350 gallons per minute.
2. Total well depth: 57 feet.
3. Inside diameter of the casing: unknown inches.
4. Static (non-pumping) water level in the well: unknown feet below ground surface.
5. Depth of water under normal pumping conditions: unknown feet below ground surface.
6. Pump column: Diameter unknown inches. Length unknown feet.
7. The well was completed on or about unknown, 19.....

MORE ON BACK

MORE ON BACK

CITY OF GERING

SCOTTS BLUFF COUNTY, NEBRASKA

Well No. 10

April, 1971

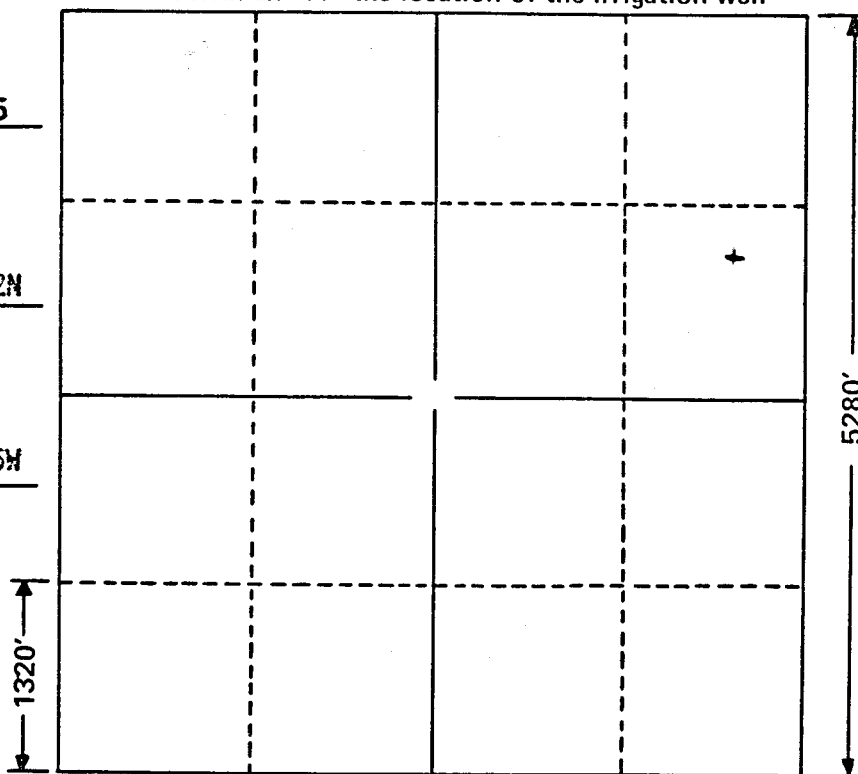
Registration

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

4/10
Date

April, 1976

Well No. 10

3

Registration No. G-57682

County

Scotts Bluff

Date Filed

8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District

SE Quarter of the NE Quarter of Section 35, Township 22, Range 55 West,
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Registration No. **G-57673** County **Scotts Bluff** Date Filed **5/25/77** ~~8-8-77~~

STATE OF NEBRASKA
WELL REGISTRATION

Is this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATION

Name & Address of well owner: **City of Gering**
Gering, Nebraska

☒ MUNICIPAL

☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte Natural Resources District
(Give Name)

NE Quarter of the **NW** Quarter of Section **35** Township **22N** Range **55W**
Scotts Bluff County. The well is **2690** feet from the **East** line and **335**

feet from the **North** line of the section and is **255** feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land: **none**

(Give Quarter Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **1100** gallons per minute.
2. Total well depth: **unknown** feet.
3. Inside diameter of the casing: **unknown** inches.
4. Static (non-pumping) water level in the well: **unknown** feet below ground surface.
5. Depth of water under normal pumping conditions: **unknown** feet below ground surface.
6. Pump column: Diameter **unknown** inches. Length **unknown** feet.
7. The well was completed on or about **not known**, 19.....

MORE ON BACK

MORE ON BACK

Well T-1

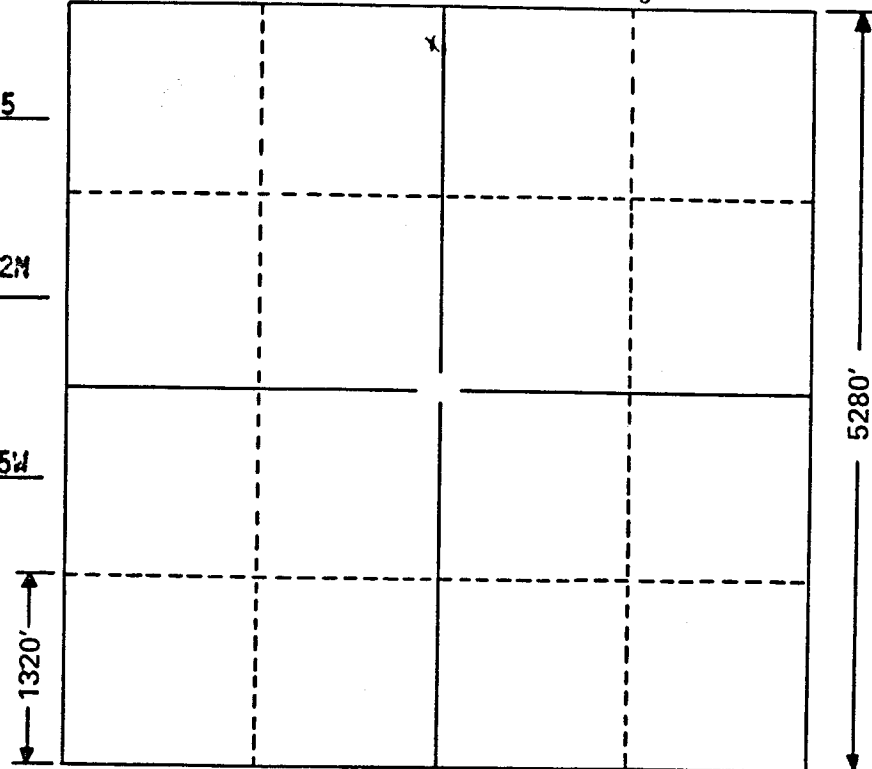
April, 19
Registrati

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

Well Owner's Signature

Date

AUG 6 1977

Registration No. **G-57673** County **Scotts Bluff** Date Filed **8-8-77**

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: **UNKNOWN**

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District
NE Quarter of the NW Quarter of Section 35, Township 22, Range 55 West
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19.....
2. Date construction was completed:, 19.....
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Well No. T-2

Registration No. C-57674 County **ScottsBluff**

Date Filed ~~3-23-77~~ **3-8-77**

STATE OF NEBRASKA
WELL REGISTRATION

Is this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

Name & Address of well owner: **City of Gering**
Gering, Nebraska

- ☐ IRRIGATION
- ☒ MUNICIPAL
- ☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Not Known

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte

(Give Name)

Natural Resources District

Quarter of the **NE** Quarter of Section **35**, Township **22N**, Range **55W**,
Scotts Bluff County. The well is **3190** feet from the **East** line and **150**
feet from the **North** line of the section and is **150** feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **1200** gallons per minute.
2. Total well depth: **unknown** feet.
3. Inside diameter of the casing: **unknown** inches.
4. Static (non-pumping) water level in the well: **unknown** feet below ground surface.
5. Depth of water under normal pumping conditions: **unknown** feet below ground surface.
6. Pump column: Diameter **unknown** inches. Length **unknown** feet.
7. The well was completed on or about **unknown**, 19....

MORE ON BACK

MORE ON BACK

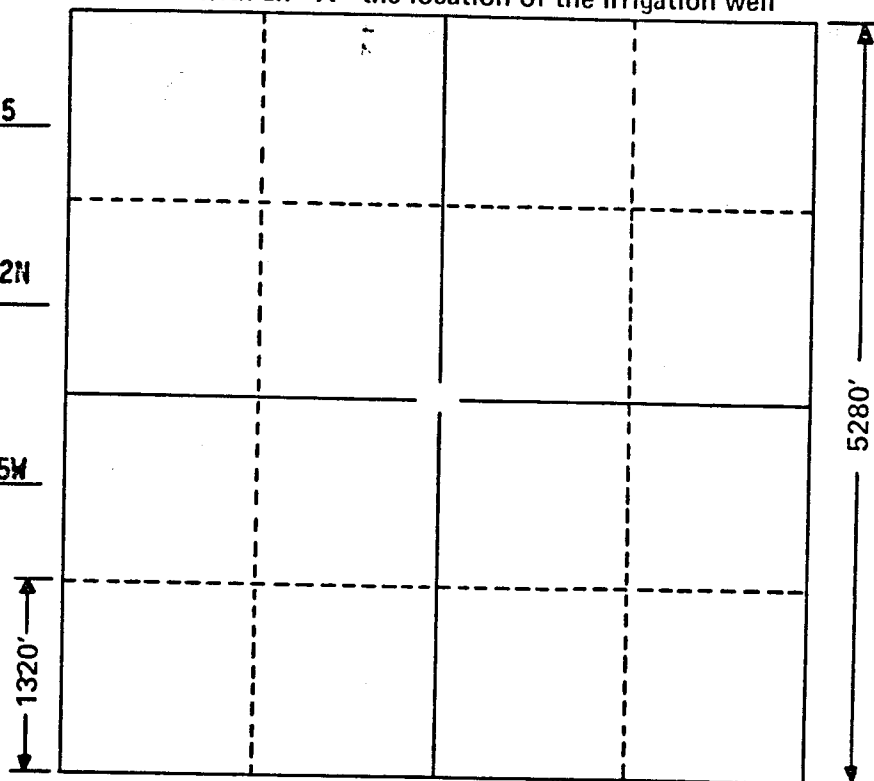
Well No. T-2

Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

[Signature]
Well Owner's Signature

AUG 6 1977
Date

Registration No. G-57674 County

Scotts Bluff

Date Filed 8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

NO INFORMATION AVAILABLE

Well Location:

..... Natural Resources District
NE Quarter of the NW Quarter of Section 35, Township 22, Range 55 West
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water..... feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Registration No. **G-57675**County **Scotts Bluff**Date Filed ~~5-25-77~~ **8-8-77**STATE OF NEBRASKA
WELL REGISTRATIONIs this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATIONName & Address of well owner: **City of Cering**
Cering, Nebraska☒ MUNICIPAL☐ INDUSTRIAL
(Check One)

Name & Address of well driller:

Unknown

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

North Platte Natural Resources District
(Give Name)NE Quarter of the **NW** Quarter of Section **35** Township **22N** Range **55W****Scotts Bluff** County. The well is **50** feet from the **North** line and **3580**feet from the **East** line of the section and is **150** feet from the nearest municipal, irrigation or industrial well.The well is intended for irrigation of all or parts of the following described land: **None**

(Give Quarter Section, Township, Range.)

amounting to approximately acres.

Well and pump specifications:

1. Pumping rate under normal conditions: **2400** gallons per minute.
2. Total well depth: **unknown** feet.
3. Inside diameter of the casing: **unknown** inches.
4. Static (non-pumping) water level in the well: **unknown** feet below ground surface.
5. Depth of water under normal pumping conditions: **unknown** feet below ground surface.
6. Pump column: Diameter **unknown** inches. Length **unknown** feet.
7. The well was completed on or about **Unknown**, 19.....

MORE ON BACK

MORE ON BACK

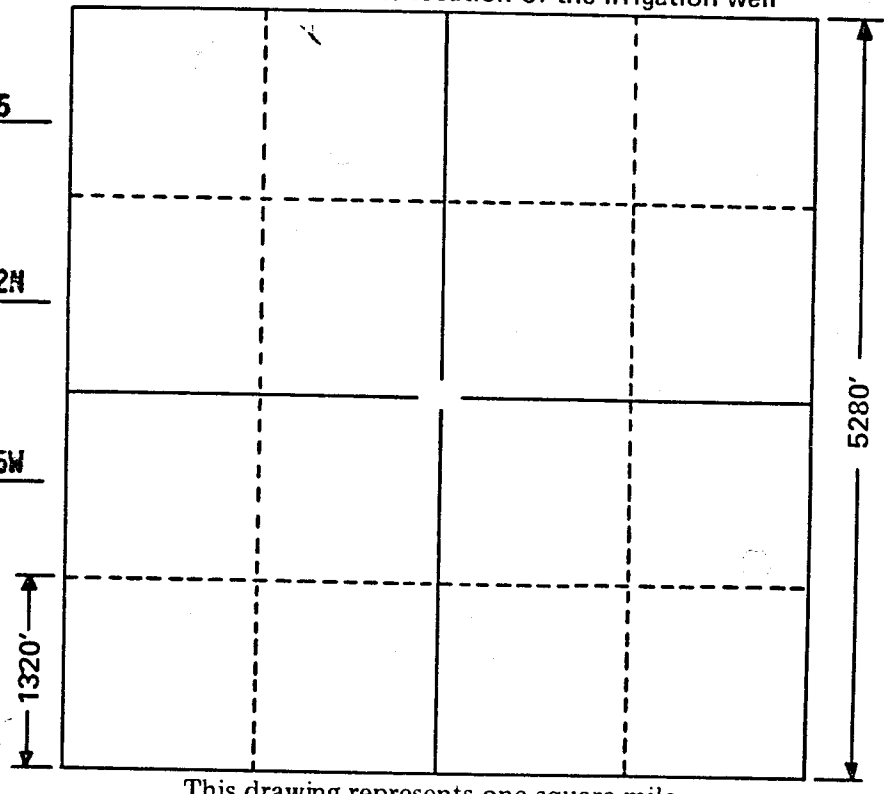
and April, 1977
Registration

Well No. 5-3
Mark with an "X" the location of the irrigation well

Section No. 35

Township 22N

Range 55W



This drawing represents one square mile.
Each small subdivision is a 40-acre tract.

I certify that I am familiar with the information contained on this registration, and that to the best of my knowledge and belief such information is true, concise and accurate.

CITY OF GERING

Richard W. Brown AUG 6 1977
Well Owner's Signature Date

April, 1976

Well No. T-3

3

Registration No. G-57675 County

Scotts Bluff

Date Filed 8-8-77

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller: UNKNOWN

Well Location:

..... Natural Resources District

NE Quarter of the NW Quarter of Section 35, Township 22, Range 55 West,
Scotts Bluff County, and owned by City of Gering

Drilling & construction specifications:

1. Date construction was begun:, 19
2. Date construction was completed:, 19
3. Diameter of the drilled hole: inches.
4. Was the hole electronically logged? ☐ Yes ☐ No.
5. How is drilled hole sealed (not sealed)?

6. Well casing & screen:
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)

7. Is the well artificially gravel stabilized? ☐ Yes ☐ No

Pumping test information:

1. Pumping rate: gallons per minute.
2. Depth to water before pumping: feet.
3. Depth to water feet after pumping minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

Registration No. G-62491 County Scotts Bluff Date Filed 10/1/79

STATE OF NEBRASKA
WELL REGISTRATION

Well # Phase I

Is this a replacement well? ☐ Yes ☒ No

If yes, give registration number of abandoned well.....

Permit No. (required only in a control area)

☐ IRRIGATION

Name & Address of well owner:

☒ MUNICIPAL

City of Gering

☐ INDUSTRIAL
(Check One)

Gering, Nebraska 69341

Name & Address of well driller:

Midwest Farm Service, Inc.

P.O. Box 366

Gering, Nebraska 69341

Location of the well: (If installation consists of a series of wells with one outlet, give details on a separate sheet.)

(Give Name)

North Platte 15

Natural Resources District

Quarter of the SE Quarter of Section 24, Township 22, Range 55 W

Scotts Bluff

County. The well is 15 feet from the North line and 100

feet from the South line of the section and is 100 feet from the nearest municipal, irrigation or industrial well.

The well is intended for irrigation of all or parts of the following described land:

(Give Quarter Section, Township, Range.)

amounting to approximately 1000 acres.

Well and pump specifications:

1. Pumping rate under normal conditions: 700 gallons per minute.
2. Total well depth: 93 feet.
3. Inside diameter of the casing: 10 inches.
4. Static (non-pumping) water level in the well: 17 feet below ground surface.
5. Depth of water under normal pumping conditions: 25 feet below ground surface.
6. Pump column: Diameter 8 inches. Length 85 feet.
7. The well was completed on or about June 22, 1979

MORE ON BACK

MORE ON BACK

April, 1976

3

Registration No. G-62491

County

Scotts Bluff

Date Filed 10/1/79

Well # Phase I

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

Permit No. (required only in a control area)

Name & Address of well driller:

Midwest Farm Service, Inc.

P.O. Box 366

Gering, Nebraska 69341

Well Location:

Wath Platte 15
NW Quarter of the SE Quarter of Section 14 26, Township 22, Range 55W
Scotts Bluff County, and owned by City of Gering, Gering, Nebraska 69341

Natural Resources District

Drilling & construction specifications:

1. Date construction was begun: April 13, 1979
2. Date construction was completed: April 17, 1979
3. Diameter of the drilled hole: 30 inches.
4. Was the hole electronically logged? Yes ☒ No ☒
5. How is drilled hole sealed (not sealed)? 0-30' cemented 30" CMP.
6. Well casing & screen: 0-71' 18" 0.375 ga. Plain; 71-96' 18" 0.375 ga Johnson Screen
(Give type of casing, lengths and vertical position of plain and slotted segments, slot or perforation size.)
7. Is the well artificially gravel stabilized? ☒ Yes ☐ No

Pumping test information:

1. Pumping rate: 750 gallons per minute.
2. Depth to water before pumping: 17 feet.
3. Depth to water: 28 feet after pumping 100 minutes.

DRILLING LOG ON BACK

DRILLING LOG ON BACK

DRILLING LOG

DEPTH IN FEET
FROM TO

MATERIAL DRILLED

0 7 Gravel

7 15 FMC sand & gravel

15 30 Fine sand & gravel loose

30 86 Med small boulders, f & m sand, v fine sand

86 93 SS light, tan firm, cream color brule

MIDWEST FARM SERVICES, INC.


Well Driller's Signature

September 12, 1979
Date